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DEPARTMENT OF THE ARMY FIELD MANUAL

FIELD ARTILLERY TECHNIQUES



HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1970

FIELD MANUAL

No. 6-20-2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 10 March 1970

FIELD ARTILLERY TECHNIQUES

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CHAPTER 1

INTRODUCTION

1-1. Purpose and Scope

a. The purpose of this manual is to provide information and guidance on the employment of field artillery. The manual covers the operations and techniques of employment of field artillery units to include command, control, and coordination; organization; operations; fire planning; and fire support coordination. The manual should be used in conjunction with FM 6-20-1 and FM 6-140.

b. The term "artillery" as used in this manual refers to field artillery.

c. The material contained herein is applicable to both nuclear and nonnuclear warfare except as otherwise noted.

d. This manual is in consonance with the following international standardization agreements which are identified by type of agreement and number at the beginning of each appropriate chapter in the manual:

TITLE	NATO STANAG	CENTO STANAG	SEATO SEASTAG	ABCA QSTAG
Operation Orders, Annexes to	2014	2014	2014	17R
Operation Orders and Administrative/Logistics Orders				
Methods of Describing Ground Locations, Areas and Boundaries	2029	2029	2029	----
Standard Proforma for Artillery Fire Plan	2031	2031	2031	----
Operational Road Movement Orders, Tables and Graphs	2041	2041	2041	51
Emergency Warnings of Hazard of Attack	2047	2047	----	110
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Battlefield Illumination	2088	2088	----	108
Fire Coordination in the Land/Air Battle	2099	2099	2099	----
Reporting Nuclear Detonations, Radioactive Fallout, and Biological and Chemical Attacks	2103	2103	----	123
Friendly Nuclear Strike Warning to Armed Forces Operating on Land	2104	2104	----	130
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General Rules Covering the Transport of Loads by Helicopter	3468	3468	3468	----
Method of Adjustment of Artillery Fire by Forward and Air Observers	----	----	----	47

1-2. Tactics

Field Artillery tactics and the fundamentals of field artillery employment are covered in FM 6-20-1 and FM 6-140.

1-3. Changes or Comments

Users of this manual are encouraged to submit recommended changes or comments to improve

the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commandant, U.S. Army Field Artillery School, ATTN: AKPSIAS-PL, Fort Sill, Oklahoma 73503.



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CHAPTER 2

COMMAND, CONTROL, AND COORDINATION

Section I. COMMAND

2-1. General

The command responsibilities of field artillery commanders and staffs are discussed in paragraph 26, FM 6-20-1 and Section I, Chapter 2, FM 6-140.

2-2. Estimates of the Situation, Plans, and Combat Orders

The field artillery commander plans for and recommends the assignment, attachment, organization, and employment of field artillery. As the fire support coordinator (FSCoord), he anticipates requirements for and coordinates and recom-

mends the employment of other fire support means. To fulfill his responsibilities and to provide the most effective fire support, the field artillery commander continually updates his estimate of the situation and his plan of fire support. His plans are incorporated into the instructions issued for the employment of the force. This continuing process is conducted concurrently at each echelon in close collaboration with the force commander and his staff. For discussion of the techniques involved in the preparation of estimates of the situation and in the preparation of plans, combat orders, and standing operating procedures, see appendixes C, D, and E of FM 101-5. For appropriate forms and samples, see the appendixes to this manual and to FM 101-5.

Section II. FIELD ARTILLERY STAFFS

2-3. General

a. The commander is provided with a staff to assist him in the exercise of command. The staff obtains appropriate information and furnishes required estimates and advice to the commander. The staff prepares the details of the commander's plans, develops his decisions and plans into orders, and disseminates the orders to the command. Various members of the staff supervise the execution of plans and orders and take the action necessary to carry them out. The staff must have a thorough knowledge of the commander's policies. In areas for which no policy has been established, the staff must initiate action to establish command policy.

b. The organization and functions of field artillery staffs are flexible and may be varied by the commander to meet the demands of each situation. Since control of field artillery and coordination of fire support are the principal responsibilities of the commander, he organizes his staff to assist him in discharging those responsibilities.

c. The organization of a staff is based on the functions of the commander and follows the organization of other military staffs (FM 101-5).

Within the limitations of the tables of organization, the staff organization and the assignment of functions to staff sections are the prerogatives of the commander.

d. The composition and organization of a theater army or army group artillery staff are determined by the artillery officer at each echelon.

e. Personnel for the artillery staffs at army and lower echelons are provided in appropriate tables of organization and equipment (TOE) (fig. 2-1 through 2-5).

f. Staff officers have no command authority. Although they may formulate and transmit orders, they do so only in the name of the commander. The limits of their authority are determined by the commander's policy. He is responsible for orders issued by members of his staff.

g. The staff officer, as chief of a staff section, supervises the personnel in his section.

h. Coordination is essential within the staff, between the staff and subordinate commanders, and between the staff and the staffs of the next higher artillery headquarters, the supported units, and the reinforced units.

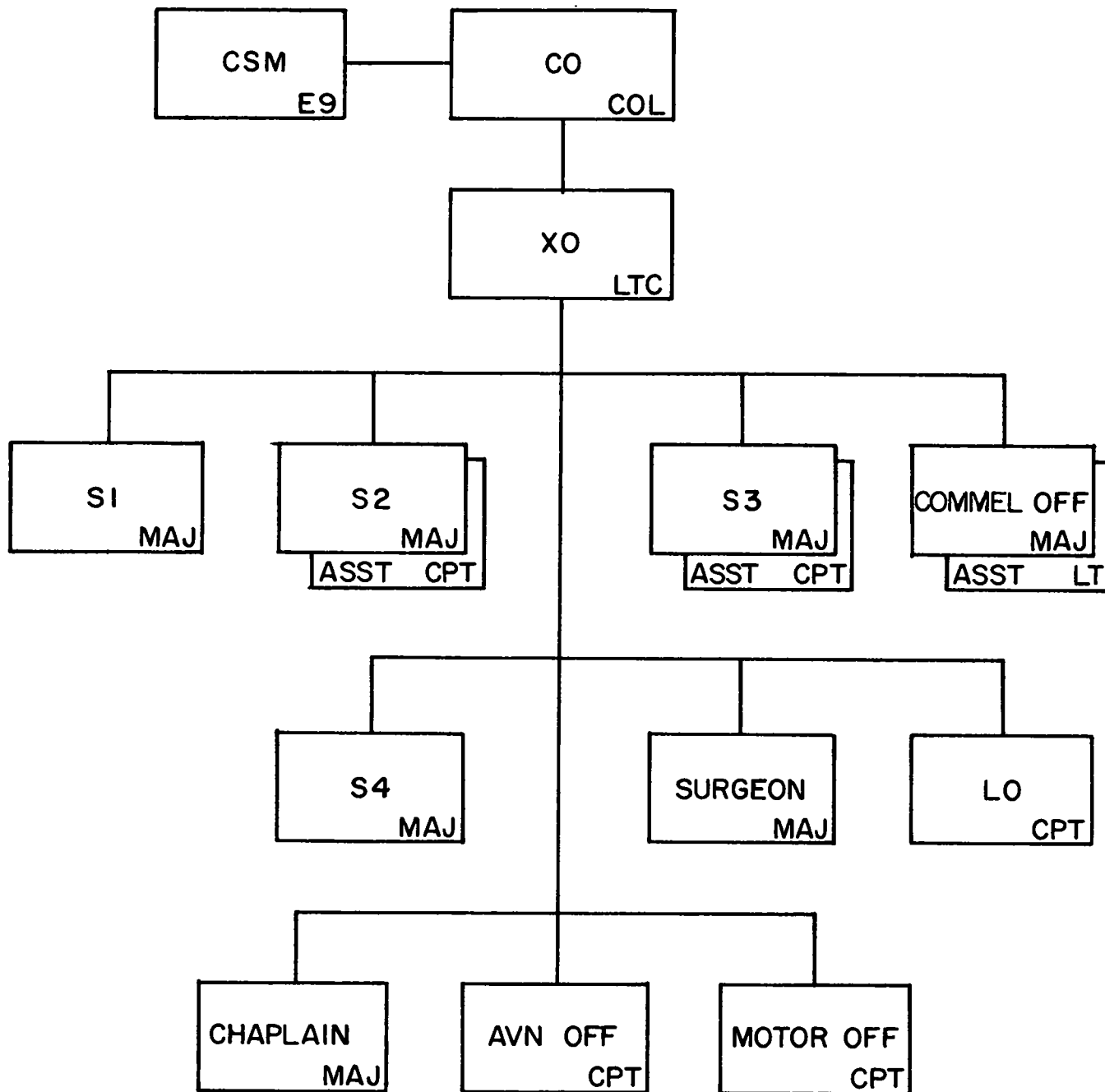


Figure 2-1. A type field artillery group staff.

2-4. Field Artillery Staff Positions

Only those field artillery staff positions involving field artillery peculiar duties are discussed in this manual. The basic duties of those staff officers not mentioned in this manual are discussed in FM 101-5. AR 570-2 designates the officer responsible for signal communication at battalion level as the communication officer. At echelons above battalion, he is designated as the communications-

electronics officer. The title, communication officer, is used in this manual to indicate the officer in charge of communication at any level. The chemical officer as discussed in FM 3-1 and FM 21-40 supervises performance of chemical target analysis and munition requirement computations.

2-5. Executive Officer

The executive officer of an artillery staff per-

forms duties similar to those set forth in section II, chapter 4 of FM 101-5 for a chief of staff. Also, he may supervise the establishment and operation of the artillery command post.

2-6. S2

The S2 of an artillery staff directs the target acquisition and intelligence effort of the information collecting agencies at his disposal. His duties are to—

a. Initiate a systematic and coordinated search for target information by all available information collecting agencies. To accomplish this, he must—

(1) Coordinate, through the chain of command and staff contacts, the work of artillery intelligence personnel and target acquisition agencies under his control and in lower echelon units. This includes coordination of the efforts of Army aviation used for field artillery target acquisition.

(2) Maintain close liaison with the intelligence sections of higher, lower, adjacent, and supported units for the purpose of exchanging information and rendering mutual assistance in the target acquisition effort.

(3) Foresee the need for, obtain, and distribute maps, photomaps, and aerial photographs.

(4) Study and interpret aerial photographs when no photointerpreter teams are available. When they are available, he must supervise their activities.

(5) Direct counterbattery intelligence activities.

(6) Originate requests for close air support reconnaissance missions.

b. Collect, evaluate, and interpret target information and intelligence and disseminate the information intelligence in time for units to act upon it.

c. Keep the commander and his staff and subordinate units informed of the enemy situation and capabilities.

d. Coordinate with the S3 on intelligence and operations.

e. Examine maps, photomaps, and aerial photographs for reliability of control and disseminate this information.

f. Prepare and disseminate intelligence reports.

g. Keep the situation map and any other pertinent records required by the commander.

h. Furnish pertinent data for the command report.

i. Prepare a counterintelligence plan and supervise its execution to include coordinating the employment of all target acquisition devices and systems.

j. Prepare the artillery intelligence bulletin (corps and army artillery S2 only) for distribution of enemy information to higher, adjacent, and subordinate commanders. These bulletins are prepared only as required.

k. Supervise artillery intelligence training.

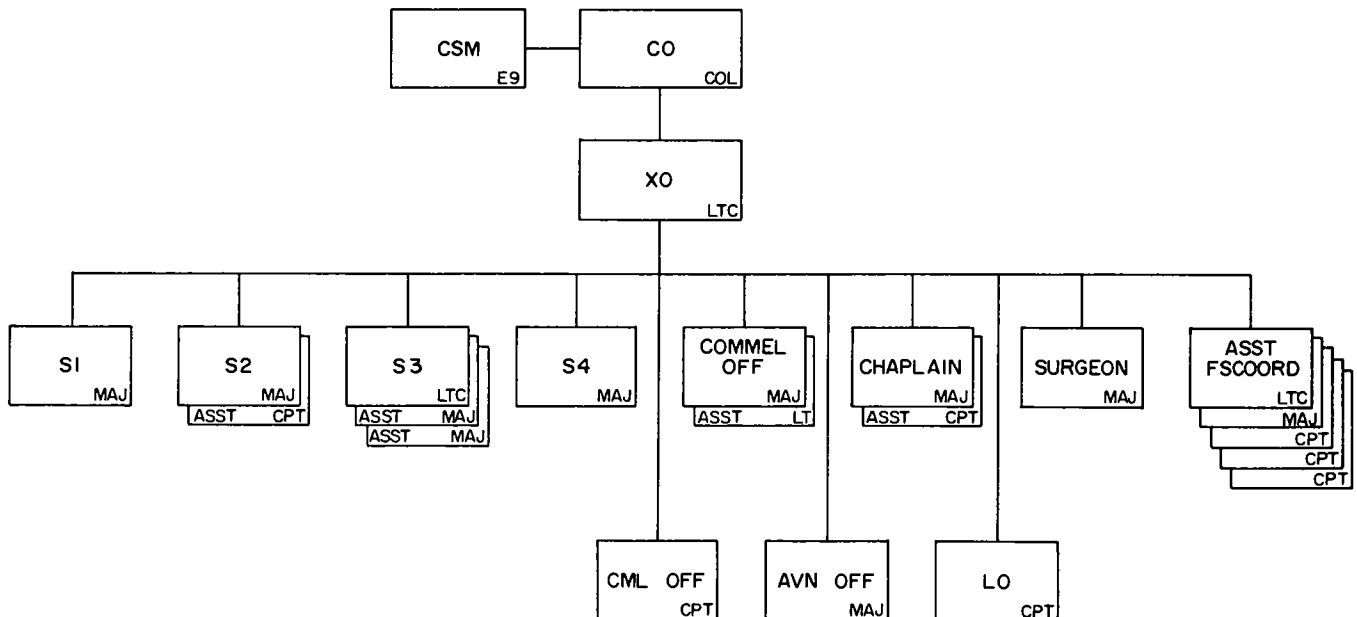


Figure 2-2. A type division artillery staff.

l. Inform the survey officer of all matters affecting survey.

m. Obtain and distribute meteorological messages.

n. Prepare surveillance diagrams.

o. Supervise operation and training of radar section.

p. Prepare target lists.

q. Supervise shell (bomb) report activities.

2-7. S3

The S3 of an artillery staff is responsible for plans, training, and operations to include attachments and detachments to and from subordinate units. His duties are to—

a. Make recommendations to the commander for the employment of field artillery weapons and units.

b. Formulate plans and prepare operation orders for the commander's approval.

c. Keep the commander and staff informed with respect to training, combat efficiency, and disposition of field artillery units.

d. Plan and supervise training and operations.

e. Coordinate with other staff officers on operations.

f. Prepare the appendix for artillery fire support.

g. Coordinate and integrate the artillery fire support of lower echelons with each other and with the overall artillery plan of operation.

h. Provide current information of artillery fire capabilities.

i. Keep the S4 informed of ammunition requirements.

j. Recommend the assignment of units to subordinate commands.

k. Plan and supervise liaison activities.

l. Maintain current information of the friendly tactical situation at the fire direction center (FDC).

m. Inform the communication officer of all plans affecting signal communication requirements.

n. In artillery units not authorized an intelligence officer, the S3, in cooperation with the S2 of the next higher artillery headquarters, will assign and supervise the work of the intelligence personnel.

o. Supervise the preparation of records and reports.

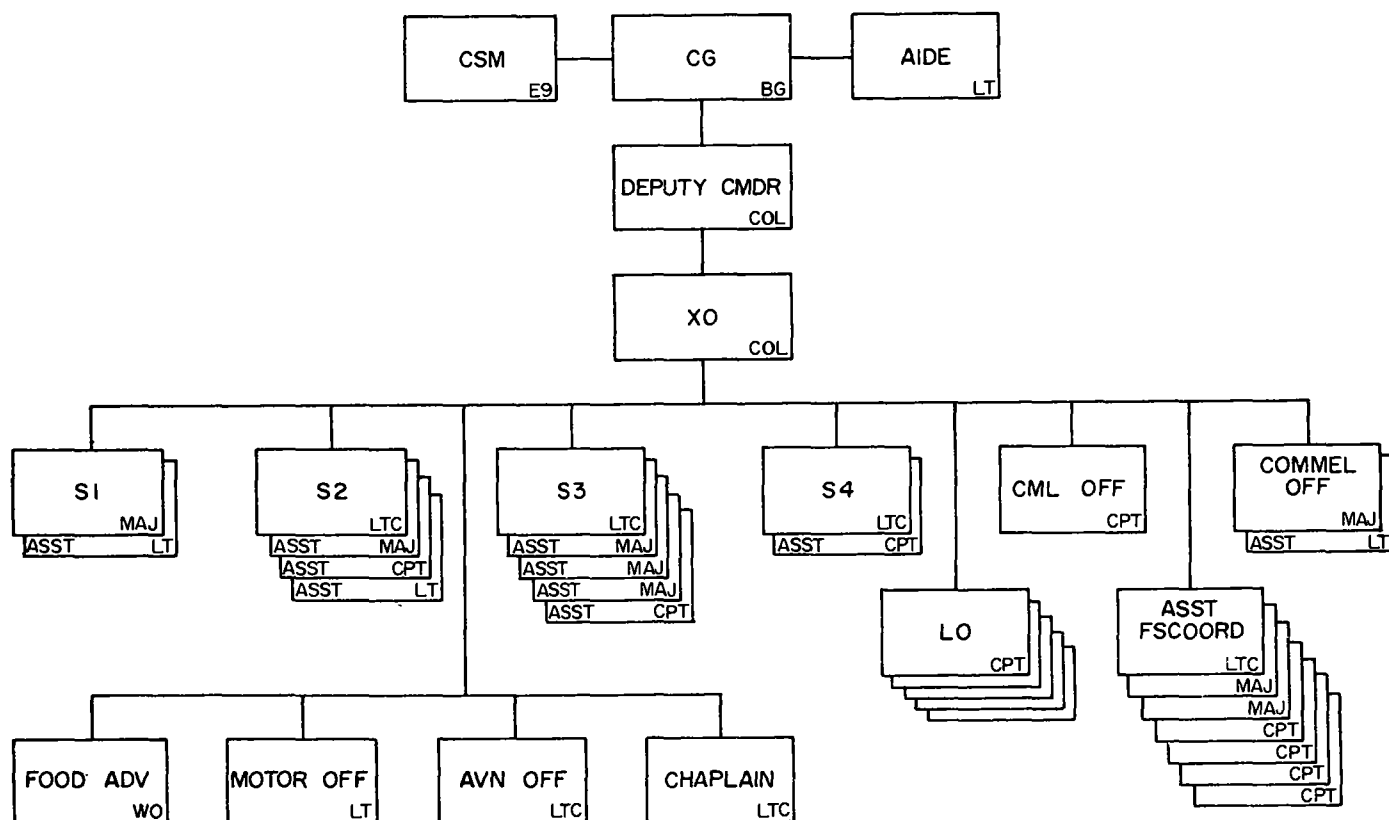


Figure 2-3. A type corps artillery staff.

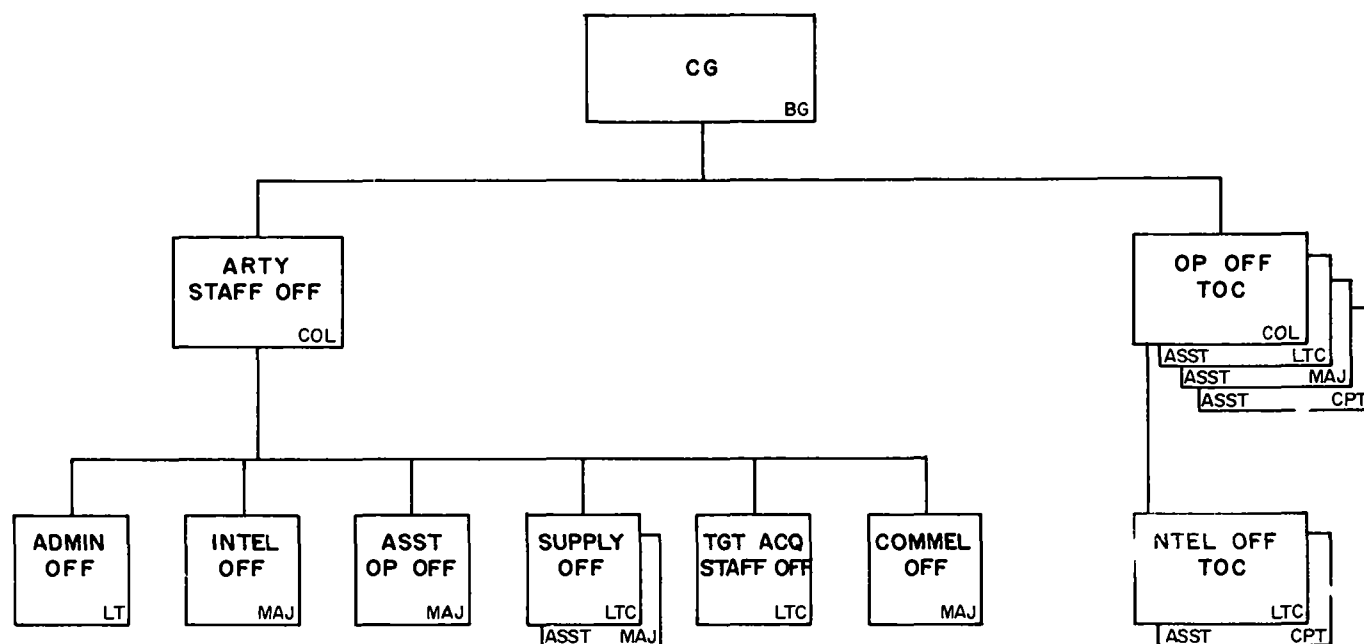


Figure 2-4. A type army artillery staff.

p. Exercise staff supervision over fire direction activities.

q. Inform the S2 of all plans affecting survey requirements.

r. Keep the fire support element (FSE) and other fire support facilities informed of the current artillery status.

2-8. Liaison Officer

a. The artillery liaison officer is the field artillery commander's representative at the headquarters of the unit to which he is sent. He is the FSCOORD at maneuver battalion level. When in the command post at brigade level and higher, he acts as the FSCOORD in the absence of his artillery commander. He supervises the training of his liaison section.

b. Upon assignment to a supported or reinforced unit and at each change in the mission of the unit, he should—

(1) Obtain all available information concerning the situation of his own unit and the unit with which he maintains liaison.

(2) Understand the plan of prearranged fires.

(3) Know the locations of registration points and meteorological (met) checkpoints.

(4) Know the status of ammunition.

(5) Know the amount of general support

and reinforcing artillery available and its location and capabilities.

(6) Know the plan of observation to include, when appropriate, the assignments of forward observers.

(7) Know his unit's plan for displacement.

(8) Secure the necessary maps or aerial photographs.

(9) Arrange with the communication officer for signal communication and obtain necessary codes and ciphers.

(10) Know what other fire support means are available.

c. Upon arrival at the command post of the unit of liaison, the liaison officer reports to the unit commander and informs him of the artillery plan, the locations of the field artillery units, and the amount of fire support available. He also establishes communication with his unit or checks the facilities already established.

d. The liaison officer—

(1) Keeps the supported or reinforced unit commander informed of the artillery situation and capabilities. The liaison officer from the direct support artillery unit acts as his commander's representative and, as such, is adviser to the supported unit commander. The liaison officer from the reinforcing artillery unit advises the commander of the reinforced unit of the availability and capabilities of reinforcing fires.

(2) Keeps his commander informed of the location and plans of the supported unit and of any changes of the location and plans.

(3) Initiates or relays requests for fires and requests for lifting fires.

(4) Arranges for and insures a prompt exchange of enemy information.

(5) Makes visits to his own command post, when conditions permit, reporting the situation and the effectiveness of the artillery support to his commander. During these visits, he gives the executive officer any data appropriate for inclusion in the unit report.

e. Duties pertaining specifically to the liaison officer of the direct support artillery unit are to—

(1) Act as fire support coordinator during the absence of his commander, prepare the artillery fire support appendix, and act as adviser on all matters pertaining to artillery fire support.

(2) Accompany the supported unit commander on reconnaissance and remain with him, as appropriate. When the supported unit is in reserve, the liaison officer usually remains with the unit.

(3) Keep his commander informed of all patrols to include the number of personnel, time of starting, route, mission, return route, and expected time of return.

(4) Coordinate the desired location of the no-fire line (NFL) and artillery final protective fires (FPF) with the supported commander and report this information to his parent unit.

(5) Supervise the activities of the forward observers with the supported maneuver companies.

f. The liaison officer of the reinforcing artillery unit keeps his commander informed of the situation and of the reinforced unit's plan for fire support, plan of operation, and need for additional observers. In reporting the situation, he includes all available information, since he may be his commander's only or primary source of information of this type. He keeps the reinforced unit commander informed of the situation of the reinforcing artillery, including changes in capabilities and present or possible commitments which may affect the reinforcing mission.

g. Even though field artillery with a mission of general support has no inherent responsibility for establishing liaison, higher headquarters can modify this mission to include liaison. In this event, the duties of the liaison officer are similar to those described in *a* and *b* above. Frequently, he must serve as a technical adviser to the com-

mander of the supported unit and be prepared to recommend appropriate artillery tasks. This is particularly applicable to liaison officers from searchlight batteries, target acquisition battalions, and field artillery missile units.

2-9. Reconnaissance and Survey Officer

The specific duties of the reconnaissance and survey officer are to—

a. Prepare and execute a survey plan.

b. Obtain survey control and carry it to lower echelon artillery.

c. Conduct reconnaissance for routes, position areas, and observation posts as directed. Paragraph 3-24, FM 21-40 and paragraph 3-4b, FM 3-12 contain guidance on chemical and radiological reconnaissance.

d. Supervise survey training.

e. Plan continuously for future reconnaissance and extension of survey.

f. Work closely with the S2 and the S3 in securing needed information on intelligence, target acquisition, observation, routes, and future position areas.

g. Exchange survey data and information with the survey officers of higher, lower, and adjacent units. This may require establishment of a survey information center (SIC).

h. Determine the accuracy of available maps.

i. Supervises route marking operations as needed.

2-10. Radar Technician

The duties of the radar technician are to—

a. Advise the commander and staff on all radar matters, including radar coverage, electronic countermeasures, and antijamming techniques.

b. Advise the S2 on, and assist him in, organizing and supervising radar training.

c. Submit necessary reports and keep pertinent records.

d. Supervise radar maintenance.

e. Provide radar liaison with higher headquarters.

f. Advise the S4 on, and assist him in, procuring radar supplies.

g. Maintain appropriate clutter and coverage diagrams.

h. Supervise radar operations.

2-11. Aviation Officer (When Authorized)

The aviation officer is the principal adviser to the

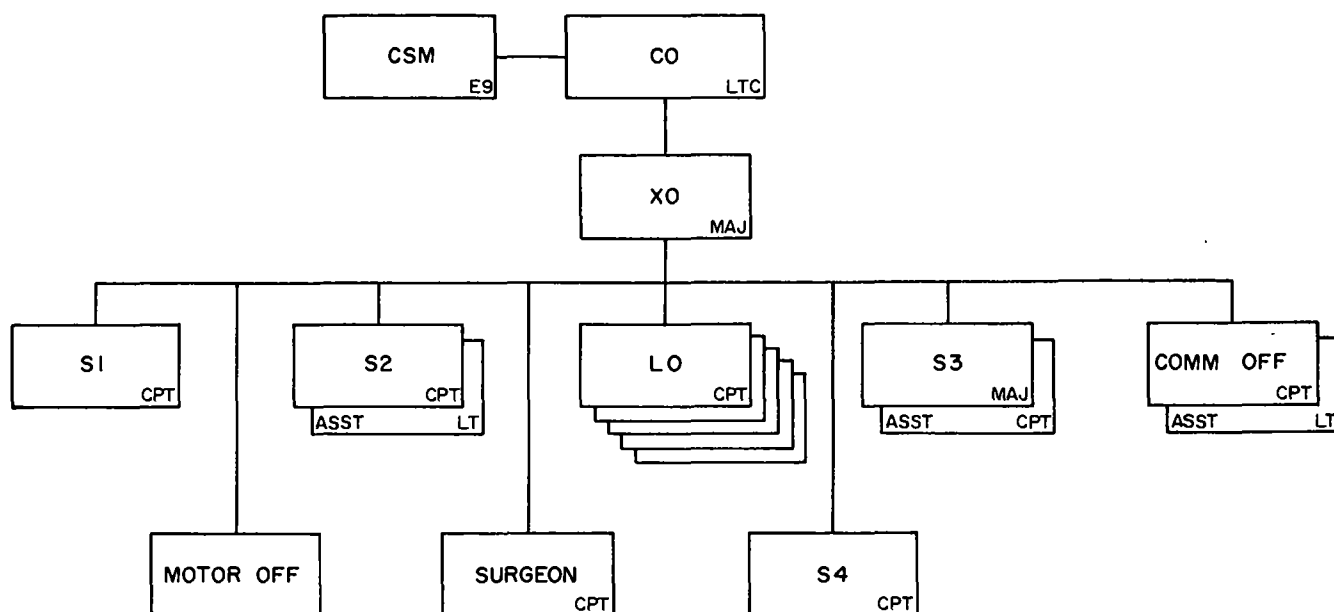


Figure 2-5. A type field artillery battalion staff.

commander and his staff on all aspects of Army aviation. He is responsible for—

- a. Processing all requests for Army aviation support from subordinate units.
- b. Allocating within the commander's stated priorities, organic aviation assets.

c. Forwarding to the appropriate airspace control element (ACE) all requests for Army aviation support that are beyond organic capabilities.

- d. Participation in training of aerial observers.
- e. Performing other duties as assigned by the commander.

Section III. COMMAND POSTS

2-12. General

The command post (CP) is the headquarters at which the field artillery commander, assisted by his staff, exercises administrative and tactical control. The headquarters is often divided into forward and rear echelons. (The command post is normally located with the forward echelon.)

a. *Forward Echelon.* Operations and intelligence are the principal staff functions conducted at the forward echelon. Other staff functions contributing to operations and intelligence are reconnaissance, survey, communications, liaison, and logistics.

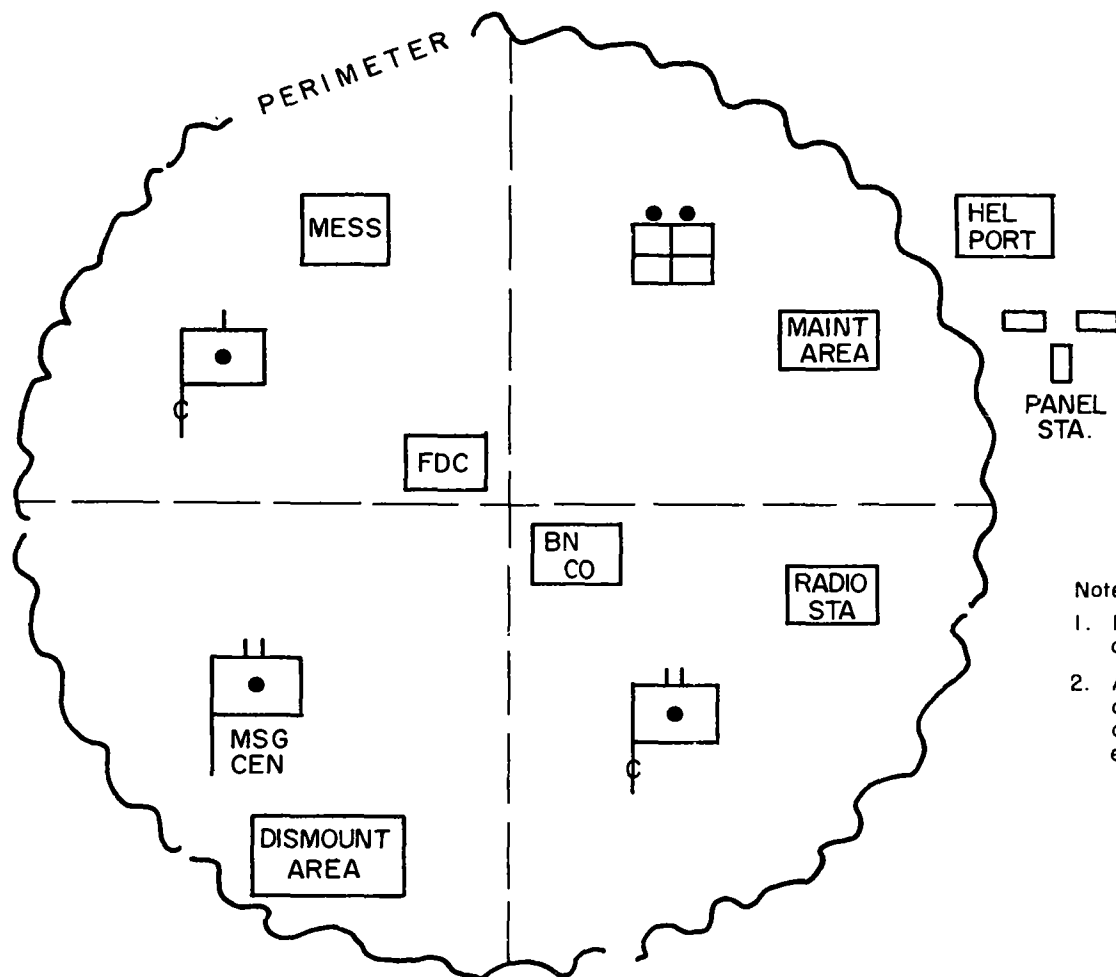
b. *Rear Echelon.* Administrative details and functions are normally conducted at the rear echelon. The rear echelon is usually collocated with other elements, such as the brigade or division rear echelon.

2-13. Command Post Area

a. *General.* The need for concealment, dispersion, reliable communications, and access routes and other tactical considerations influence the se-

lection of a location for the artillery command post. However, the most important factors influencing the selection of the command post area are the requirements for exercising control of subordinate FA units and for fire planning and the ability to function in an emergency as a force command post. The fire direction center is located with the field artillery headquarters battery or headquarters element. The element that coordinates fire support is usually located at the command post of the supported force, where it establishes the fire support coordination center (FSCC) or fire support element (FSE), as appropriate or as desired.

b. *Physical Layout of the Command Post.* The physical layout of the command post depends on the space available, the operations required, the terrain, the shelter available, and the policy of the commander. The tactical operations sections must be so located as to facilitate the coordination of their functions. The fire direction center and the operations and intelligence sections must be collocated to make voice communications possi-



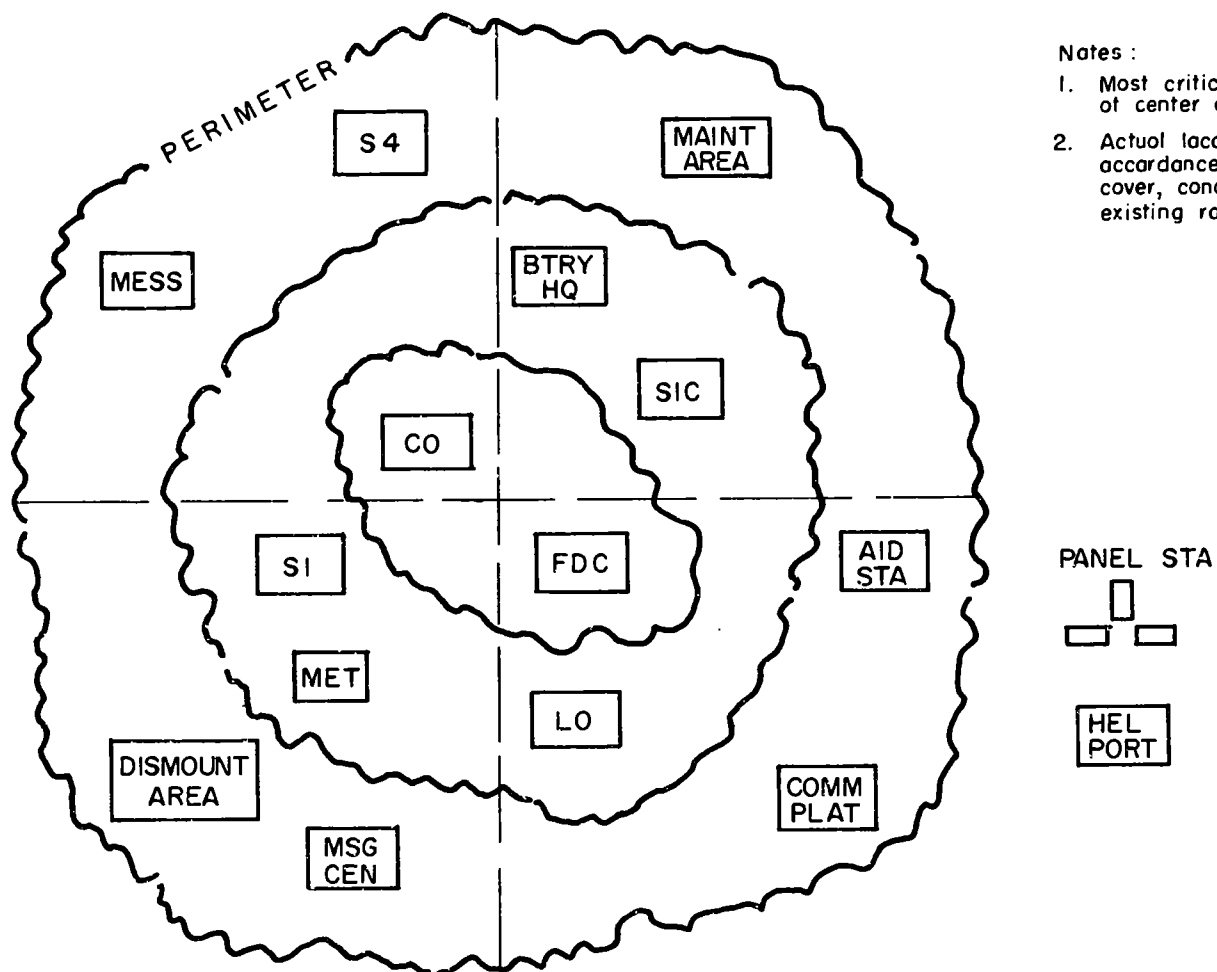
Notes :

1. Most critical installations at center of area.
2. Actual location will be in accordance with available cover, concealment and existing road net.

Figure 2-6. A type FA battalion command post area.

ble. This complex must be located away from other command post elements and sufficiently distant from the command post entrance so as not to attract casual visitors. The locations of the other

elements of the command post will be dictated by the situation. Type command post layouts are shown in figures 2-6 and 2-7.



Notes :

1. Most critical installations of center of area.
2. Actual location will be in accordance with available cover, concealment and existing road net.

Figure 2-7. A type division artillery command post area.



CHAPTER 3

FIELD ARTILLERY ORGANIZATIONS

Section I. UNITS

3-1. General

a. The organization of field artillery units and headquarters is shown in detail in appropriate tables of organization and equipment (TOE). The grouping of artillery units is flexible and is determined by the organization for combat (sec III, chap 3, FM 6-20-1).

b. This chapter discusses the organizational requirements for and the functions of field artillery units and headquarters.

3-2. Classification

Units are classified as firing and nonfiring units. An artillery firing unit is a cannon battery, a missile section, or two armed aircraft (aerial field artillery). Nonfiring units include the headquarters and service batteries of battalions, searchlight batteries, field artillery target acquisition battalions and batteries, and aviation elements.

3-3. Echelons

a. The battery is the smallest tactical and administrative unit of the field artillery. The principal weapon of the firing battery is the cannon, missile or rocket. The prime armament of aerial artillery consists of rocket launchers, machineguns, and grenade launchers.

b. The field artillery battalion is both a tactical and an administrative unit. All battalions are self-sustaining. The number of batteries in a battalion is determined by the mission and structure set forth in the battalion table of organization and equipment.

c. The field artillery group, division artillery, corps artillery, army artillery, army group artillery, and theater army artillery are discussed in chapter 3, FM 6-20-1.

3-4. Organizational Requirements, General

a. Field artillery firing units are organized to effectively deploy and employ a specific weapon system to obtain the required effects on a target.

To accomplish its mission, a firing unit must be provided with—

- (1) Weapons and munitions.
- (2) Communications.
- (3) A target acquisition capability (some units).
- (4) Transportation.
- (5) Logistical support.
- (6) Fire control capabilities.
- (7) A survey capability.
- (8) A security capability (separate battery).

b. Reaction time and responsiveness to command requirements are optimum when the elements in *a* above are organic to the firing unit.

c. Firing units require ballistic meteorology data. This data is provided by division, corps, or army artillery headquarters.

d. Target acquisition capabilities are normally organic to field artillery cannon units. Field artillery missile units are normally provided target information by the supported force headquarters or higher artillery headquarters.

3-5. Organizational Requirements, Specific

a. The weapons (cannon, missile launchers, or aerial artillery platforms) are organic to the firing batteries of the battalion.

b. The necessary communications equipment and operating personnel are normally organic to all artillery echelons.

c. The target acquisition capability may be organic to the headquarters of the field artillery unit, or target information may be provided by higher headquarters.

d. The transport (mobility) provided at all echelons of artillery must be equal to or greater than that of the combat element the artillery unit is required to support.

e. The battery resupply functions are generally limited to class I, class III, and class V supplies. The battalion is responsible for resupply of all classes of supply.

f. The major fire control function is performed at battalion level (technical fire direction) and at higher headquarters (tactical fire direction). Fire control may be exercised at battery level, enabling the battery to assume the battalion function or to operate separately. In FA missile units,

technical fire control is a function of the firing battery or the launcher section.

g. The survey capability may be organic to the firing unit, or survey data may be provided by a higher artillery headquarters.

Section II. HEADQUARTERS

3-6. Battalion Headquarters and Headquarters Battery

a. A battalion headquarters consists of the commander, the sergeant major, and the principal staff officers.

b. The headquarters battery contains the remainder of the personnel and all of the equipment required.

c. The following operational functions are provided for in a typical battalion:

- (1) Command.
- (2) Personnel.
- (3) Intelligence and target acquisition.
 - (a) Observation.
 - (b) Survey.
 - (c) Radar (direct support battalions only).
- (4) Operations and fire direction.
- (5) Liaison.
- (6) Communications.
- (7) Medical.
- (8) Air Defense.

d. When the battalion does not contain a separate service battery, the following functions are also included:

- (1) General supply and service.
- (2) Ammunition supply.
- (3) Maintenance.

3-7. Artillery Headquarters and Headquarters Battery at Echelons Higher Than Battalion

a. The headquarters and headquarters battery at artillery echelons higher than battalion contains many of the same elements as a battalion headquarters plus additional elements (sections) required by the expanded mission at such echelons. Functions at these higher echelons are broader in scope and require additional personnel and skills.

b. In addition to the elements listed in paragraph 3-6a, some of the higher artillery headquarters provide—

- (1) Personnel to operate a fire support element.
- (2) Meteorological section.
- (3) Counterbattery and surveillance radar.
- (4) Army aviation.

CHAPTER 4

CONDUCT OF OPERATIONS

(NATO STANAG 2041, CENTO STANAG 2041, SEATO SEASTAG 2041, ABCA QSTAG 51)

Section I. POSITIONING FIELD ARTILLERY UNITS

4-1. General

a. This chapter covers the fundamentals of tactical operations of field artillery cannon/rocket battalions. The same principles, with modification, apply to field artillery cannon and missile batteries (chap 5, FM 6-140 and chap 5 and 6, FM 6-61).

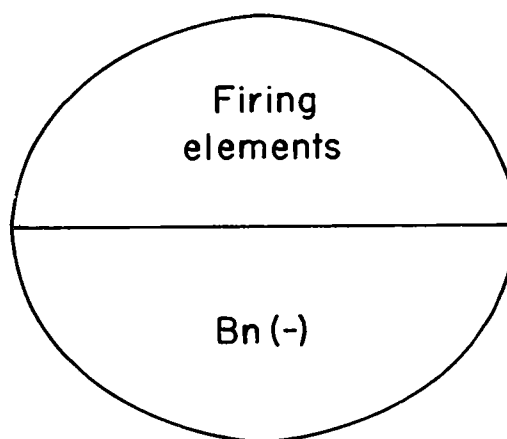
b. For a discussion of tactics for airmobile artillery, see section X, chapter 7, of this manual.

4-2. Methods

There are four general methods of positioning field artillery units (*a* through *d* below). Each method has many advantages and disadvantages. The value of a particular method depends on the type of unit, the situation, the mission, and the enemy

capabilities. Each method may be varied, or modified, or combined with one or more of the other methods to meet the requirements of a specific situation.

a. Method 1. In method 1, the battalion occupies a position area (fig. 4-1). The position area always includes the firing positions. Firing elements and headquarters and service elements are within the same perimeter. Firing elements are positioned and every feasible action is taken to insure that the time required to prepare for and fire a mission is kept to a minimum. Displacement of the firing elements or other elements of the battalion is made as required by the tactical situation. The battalion commander selects or recommends (appropriate to his mission)



Headquarters and service elements and firing elements in a common perimeter. This area includes the firing batteries of a cannon or missile battalion. The area includes firing positions. Alternate and supplementary positions are not shown.

Figure 4-1. Battalion position area—method 1.

alternate and supplementary positions to which the battalion or its elements can displace.

(1) The principal advantages of method 1 are as follows:

(a) Command, administration, messing, survey, communications, and local security are simplified.

(b) The time and effort required to resupply ammunition to firing sections are reduced.

(2) The principal disadvantages of method 1 are as follows:

(a) Concentration of personnel, vehicles, and weapons in one area facilitates enemy detection.

(b) A single attack with nuclear, biological, or chemical weapons could neutralize the entire battalion.

(c) Displacement of the entire battalion may be necessary if the position is discovered.

(d) Repeated firing of weapons from the same positions may disclose the battalion's location.

b. *Method 2.* In method 2, the battalion occupies a position area (fig. 4-2). The position area always includes the firing positions. In this instance, the firing elements and headquarters and service elements are in separate perimeters. As in

method 1, firing elements are positioned and every feasible action is taken to insure that the time required to prepare for and fire a mission is kept to a minimum. Displacement of the firing elements or other elements of the battalion is made as required by the tactical situation. The battalion commander selects or recommends (appropriate to his mission) alternate and supplementary positions to which the battalion or its elements can displace.

(1) The principal advantages of method 2 are as follows:

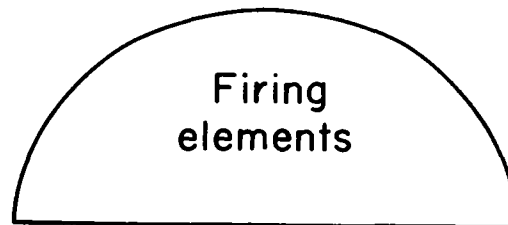
(a) Locating firing elements and headquarters and service elements in separate perimeters makes it more difficult for the enemy to neutralize the battalion with a single nuclear or chemical weapon.

(b) Enemy action against one element of the battalion may not require displacement of the entire battalion.

(c) Deploying the battalion elements in more than one area makes it more difficult for the enemy to locate the entire battalion.

(2) The principal disadvantages of method 2 are as follows:

(a) Command, administration, messing, survey, communications, and local security are more complex than in method 1.



Headquarters and service elements and firing elements in separate perimeters. The firing elements perimeter includes primary firing positions. Alternate and supplementary positions are not shown.

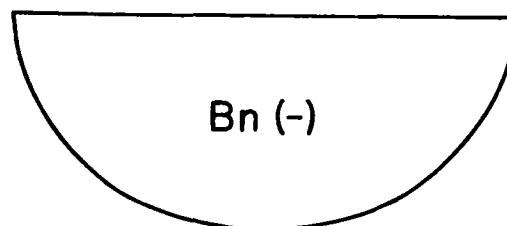


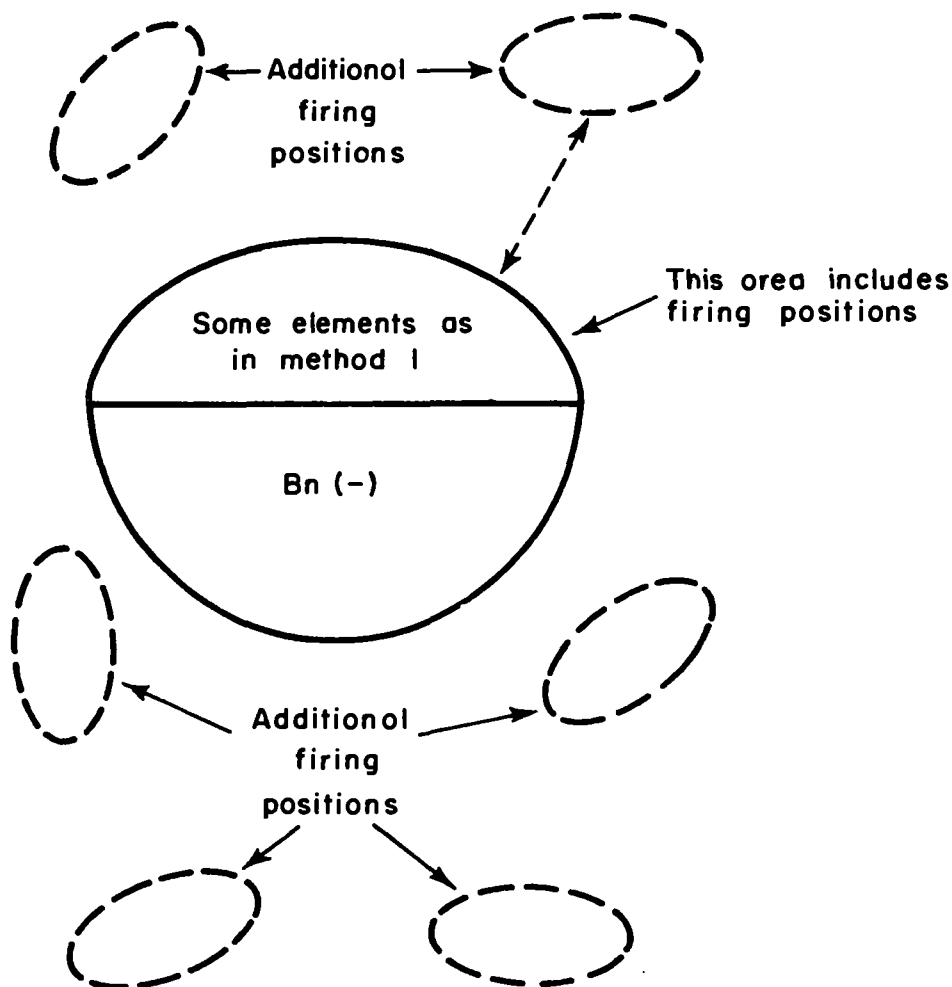
Figure 4-2. Battalion position area—method 2.

(b) The time and effort required to resupply ammunition to firing sections are greater than in method 1.

(c) Repeated firing of weapons from the same positions may disclose the locations of the weapons to the enemy.

c. *Method 3.* When method 3 (fig. 4-3) is used, the firing elements and the headquarters and service elements are within the same perimeter. Priority is given to the establishment of unoccupied firing positions outside the common perimeter. The additional firing positions are selected to provide the desired fire capabilities. Time permitting, one of these additional firing positions is

used for firing a mission. The firing element occupies the position only long enough to complete the fire mission; it then returns to the battalion position area. Firing positions in the battalion position area are used only when conditions make it infeasible to fire the mission from another location. Firing elements are positioned and every possible action is taken to insure that minimum time is required to prepare for and fire a mission from the battalion position area. Displacements, other than the movement of firing elements, are made as required by the tactical situation. The battalion commander selects or recommends (appropriate to his mission) alternate and supple-



Headquarters and service elements and firing elements in a common perimeter. Fire missions are normally accomplished from firing positions outside the perimeter, such positions are occupied only long enough to complete the fire mission. Alternate and supplementary positions are not shown.

Figure 4-3. Battalion position area—method 3.

mentary positions to which the battalion or its elements can displace.

(1) The principal advantages of method 3 are as follows:

(a) Elements of the battalion are separated for relatively short periods of time, simplifying command, administration, messing, and local security.

(b) Enemy detection of the firing positions does not disclose the location of the remainder of the battalion.

(c) Displacement of a firing element after firing reduces the possibility that it will be damaged by counterbattery fire directed against its firing position.

(2) The principal disadvantages of method 3 are as follows:

(a) A single nuclear weapon delivered on the battalion position area could neutralize the battalion.

(b) Survey and communications are more difficult than in methods 1 and 2.

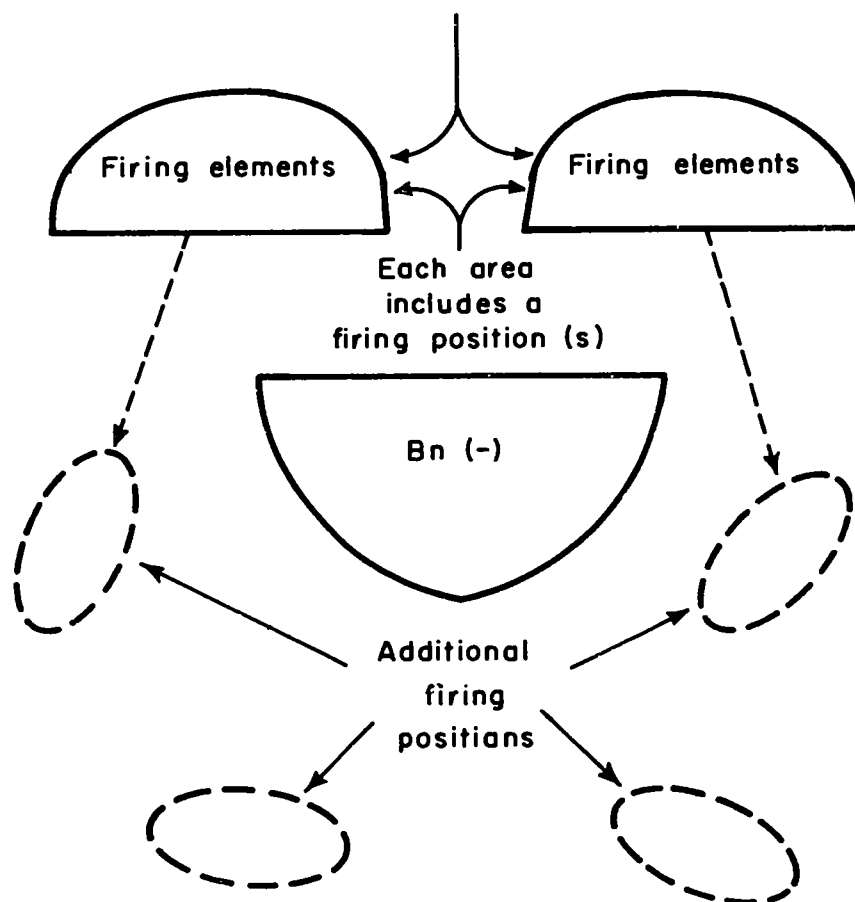
(c) Lack of suitable position areas, time, and routes may prevent the use of method 3.

(d) The requirement to provide sustained fire may prevent the use of this method by cannon battalions.

(e) If the battalion is required to fire from positions within the common perimeter, all the disadvantages of method 1 accrue.

d. *Method 4.* When method 4 (fig. 4-4) is used, the firing elements and the headquarters and service elements are in separate perimeters. One or more firing sections are located in each firing position.

Each of these areas includes one or more firing sections and may include a battery. The number of these occupied areas can be varied to meet the needs of the unit.



Headquarters and service elements and firing elements in separate perimeters. The firing element occupies another firing position on completion of a fire mission.

Figure 4-4. Battalion position area—method 4.

sition. Unoccupied additional firing positions are selected as necessary to provide the desired fire capabilities. As in method 2, the firing elements are initially located outside the headquarters and service perimeter. The principal difference between this method and method 2 is that the firing element(s) moves to another firing position as soon as a fire mission is completed. Firing sections are positioned and every possible action is taken to insure that the time required to prepare for and fire a mission is kept to a minimum. Displacements, other than the movement of firing elements, are made as required by the tactical situation. The battalion commander selects and recommends (appropriate to his mission) alternate and supplementary positions to which the battalion or its elements can displace.

(1) The principal advantages of method 4 are as follows:

(a) The dispersion of battalion elements provides the battalion with a high degree of passive defense against nuclear attack.

(b) Detection and enemy counterbattery fires would probably require displacement of only the element under attack, allowing the remaining elements to continue firing.

(c) The dispersion of battalion elements makes enemy detection of the entire battalion more difficult.

(2) The principal disadvantages of method 4 are as follows:

(a) Command, administration, messing,

and local security are more complicated than in the other methods.

(b) Survey and communications are more difficult than in methods 1 and 2.

(c) Achieving the maximum rate of fire of the battalion is difficult.

(d) Firing elements may be detected during displacements.

(e) Lack of suitable position areas, time, and routes may prevent the use of this method.

(f) The requirement to provide sustained fire may prevent the use of this method.

(g) Considerable time and effort are involved in ammunition resupply.

4-3. Locating and Displacing Elements

a. Regardless of which of the methods described in paragraph 4-2 is used, the headquarters and service elements may be located together or separately, depending on the desires of the battalion commander or on instructions from the division artillery commander.

b. The authority to order intrabattalion displacement of the type peculiar to methods 3 and 4 usually rests with the battalion commander. The authority to order displacement to alternate and supplementary positions is established in the inherent responsibilities of tactical missions (sec II, chap 3, FM 6-20-1).

c. Units with a nuclear capability must keep the fire support element/fire support coordination center (FSE/FSCC) informed of the locations of all firing positions.

Section II. RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION

4-4. General

The purpose of reconnaissance, selection, and occupation of position (RSOP) is to move the battalion from a position area, a bivouac area, an assembly area, or a march column into a position from which it can deliver the fire required to accomplish its mission. Artillery reconnaissance is aggressive and continuous. It is planned and organized to be performed in a minimum length of time. Decentralization of effort is usually necessary in conducting a rapid and efficient reconnaissance.

4-5. Battalion Commander's Party

a. The battalion commander's party consists of the personnel and equipment needed to assist the commander in his reconnaissance, the formula-

tion of his plan, the issuance of orders, and the preparation for the occupation of position. The composition of the party will vary according to the type of battalion, the mission, and the restrictions on the number of vehicles if the battalion is operating in the forward area. It is desirable that the battalion commander take with him the S2, the S3, the communication officer, the survey officer, and a messenger. If possible and appropriate, he may take with him any or all of the following:

- (1) A radar representative.
- (2) The battery commanders and their parties.
- (3) The survey section.
- (4) The communication chief.
- (5) Wire-laying vehicles.

b. In cannon battalions, it may be desirable to include one weapon and crew in the party to complete registration and to set up the firing chart before arrival of the battalion. If there is no restriction on registration, this is particularly advantageous when the position is to be occupied at night and fires are to be delivered before daylight.

4-6. Battalion Position Areas

The term "battalion position area" is defined as that area occupied by the battalion with its elements arranged for battle. Specifically, it is the area occupied by those elements of the battalion responsible for conducting the fire missions and providing security for the unit. A position area given in orders, on maps, or on overlays indicates the area within which the weapons must be placed but does not constitute a restraining line for all elements of the battalion; e.g., observation posts will usually be located at some distance from the position area and the countermortar radar section will normally be outside the position area. Direct support field artillery normally has position priority within the division area, and division artillery battalions normally have position priority over corps artillery units within the division area. In nuclear combat, first priority for positions must be given to nuclear to nuclear-capable artillery.

a. *Offense.* In the offense, cannon artillery positions should be selected well forward to support the attack and to avoid early displacement. When circumstances warrant, the battalion may occupy and organize the position without firing from it prior to the attack. Registration and harassing and interdiction (H&I) fires may be delivered from supplementary positions.

b. *Defense.* In the defense, artillery positions should be echeloned in depth to provide flexibility of fire and to insure continuity of support in the event of an enemy penetration which requires field artillery units to displace to the rear. All division cannon artillery and aerial field artillery (if available) should be capable of firing immediately in front of the forward edge of the battle area (FEBA). Direct support artillery battalions should be able to provide close support for the forward companies and for the primary positions of the reserve companies of the maneuver element being supported. Maximum use of range capabilities should be made from primary positions to provide longer range fires. Forward supplementary positions are needed from which to

provide longer range fires forward of the combat outposts (COP). Supplementary positions to the rear are needed from which to provide fires in depth within the battle area. Units with a nuclear capability are positioned laterally and in depth to provide the most effective continuous support. Alternate positions should be selected and prepared. Registration and H&I fires may be delivered from supplementary positions to make it more difficult for the enemy to detect the primary positions. Division artillery units are normally required to provide final protective fires (FPF) for the defending forces.

4-7. Observation Posts

Battalion observation posts (OP), including forward observation posts, are selected to give the best possible coverage in width and in depth. The primary consideration in locating observation posts is to insure complete observation over the battalion's entire zone of fire. Complete observation is obtained by locating observation posts so that areas masked from one observation post can be seen from another. Available flank and air observation is used to overcome defilade. Other considerations are—

- a. Ease of installation and maintenance of communications.
- b. Ease of concealment of locations and routes of access.
- c. Ease of coordination with adjacent units to insure adequate coverage along boundaries of the supported unit's zone of action or sector of defense.
- d. Avoidance of outstanding landmarks (sec II, chap 8, FM 6-140).

4-8. Radar Positions

a. The S2 must advise the artillery commander on the location of the radar position area. In designating a position area, the artillery commander assigns an area large enough to permit selection of the actual radar site based on technical considerations affecting radar operations.

b. The principal considerations governing the selection of a radar position area are proper coverage of the zone of action of the supported unit, technical capabilities and limitations of the radar set, and integration of the radar's zone of search with the zones of other units as directed by the higher artillery commander.

c. In the offense, the radar position should be well forward to avoid early displacement. In the

defense, the general location of the radar position may be prescribed by the higher artillery commander to provide depth to the radar operations of the force. The proximity of the radar position to the area of search is determined by the technical limitations of the equipment. Other considerations in the selection of the position, such as security, cover, concealment, and ease of communications, are the same as those in the selection of a battery position (chap 4, FM 6-140).

4-9. Control Points for Marches

a. Start Point. Any designated place at which a column or element thereof is formed by the successive arrival of its various subdivisions, and comes under the control of the commander ordering the move. It should be an easily distinguishable feature on the route of march that all units can reach without countermarching and without crossing the movement of another unit.

b. Release Point. A release point (RP) is that point on the route of march at which the batteries will be released from battalion march control. Battery guides will meet the column at the release point and guide their batteries into the position. The release point should be located on the march route short of the position area and at a place where traffic can be controlled. Crossroads, defiles, or other locations subject to interdiction fire or traffic congestion should be avoided.

4-10. Steps in Reconnaissance, Selection, and Occupation of Position

a. Placing a battalion in position involves several tasks, which are performed simultaneously or in sequence. The manner of accomplishing these tasks varies with the mission, the time available, and the type of battalion. A self-propelled artillery battalion, when operating as part of a task force, will frequently occupy positions (often from march column) with little previous reconnaissance. In this case, prompt opening of fire takes precedence over all other considerations. The airborne artillery must make its reconnaissance and selection of initial positions from photographs or maps, since the airborne artillery commander has no opportunity to see or point out positions on the ground. Upon arrival in the drop or landing zone, the batteries must be prepared to go into action by piece, if necessary, consolidating and organizing their positions as the situation permits. A standing operating procedure (SOP) for the reconnaissance, selection, and occupation of position is necessary to expedite rapid and

efficient emplacement of artillery. In all cases, the general principles apply, varying only in their application.

b. The procedures for an RSOP may include the following steps:

(1) Receipt of orders (own initiative for DS artillery battalion commanders).

(2) Planning the reconnaissance.

(3) Conference with the supported or reinforced unit commander.

(4) Reconnaissance for the release point, battery positions, observation posts, the counter-mortar radar position (when appropriate), the command post, the aid station, and routes and selection of the actual locations on the ground for the elements of the battalion.

(5) Formulation of a plan for occupation of the selected positions.

(6) Issuance of orders to carry out the plan.

(7) Preparation for occupation—survey, installation of communications, and route marking.

(8) Movement of the battalion to the position area.

(9) Occupation and organization of the position.

4-11. Receipt of Orders

The battalion commander may receive an oral or a written order from his higher commander to occupy a position or in the instance of a direct support artillery battalion commander to displace due to changes in the situation. If he must report to his higher commander to receive the order, the battalion commander is usually accompanied by his party.

4-12. Planning a Reconnaissance

Reconnaissance enables the battalion commander to make decisions on which to base his orders for the occupation. The assignment of reconnaissance missions to members of the battalion commander's party depends on the time available, the size of the area to be covered, the size of the party, and the personal desires of the battalion commander. In the following example of operations that may be performed by members of the party, the battalion commander may desire to make an initial reconnaissance of the battery positions and routes by means of aircraft:

<i>Reconnaissance or task</i>	<i>Performed by</i>
Selects the registration point and initial targets.	S3 and/or reconnaissance and survey officer.

<i>Reconnaissance or task</i>	<i>Performed by</i>
2 Formulates the plan of observation including locations of observation posts and areas of responsibility and radar sites when applicable.	S2.
3 Formulates the survey plan	Reconnaissance and survey officer.
4 Selects position areas and routes.	Reconnaissance and survey officer or S3 (battery commander, if available).
5 Formulates communication plan.	Communication officer.
6 Selects command post location.	Headquarters battery commander and/or communication officer.
7 Selects countermortar radar location.	S2.
8 Selects aid station location	Headquarters battery commander and/or representative of the medical section.
9 Checks camouflage and security.	S2.
10 Selects starting point (SP) and release point (RP).	S3.

4-13. Conference With Supported or Reinforced Unit Commander

On receiving a direct support or reinforcing mission, the battalion commander establishes liaison with the supported or reinforced unit. If he has been assigned a position area by the higher commander, he starts his reconnaissance for battery positions, observation posts, and other installations at once. If he has not been assigned a position area, he may have to confer with the supported or reinforced unit commander (if available) and the battalion CBR officer before completing his reconnaissance. Usually, the battalion commander starts his reconnaissance immediately and chooses tentative locations for various installations, making the final decision following his conference with the supported or reinforced unit commander.

4-14. Reconnaissance, Selection, and Occupation of Position From Rear Area

a. Action Prior to Leaving the Area. Before leaving the bivouac or assembly area, the battalion commander briefs the battalion executive officer and issues orders to expedite the occupation of the position. Depending on his current information, he may issue orders concerning—

- (1) Movement of elements of headquarters

battery, staff officers, and battery commanders and their parties to a location from which they can be brought forward quickly to receive the battalion order.

(2) Probable routes, start points, release points, time of movement, and use of route markers.

(3) Prearranged radio codes for use during movements.

(4) Probable order of march.

b. Instructions for Reconnaissance Party. After briefing the selected staff officers, the artillery commander assembles the members of his reconnaissance party, briefs them on the situation, and issues the necessary instructions to include the requirement for chemical or radiological reconnaissance if necessary. He points out, on the ground or on a map, the general location for the position area and the tentative general location for each installation. If he plans to make a personal reconnaissance, he designates the time and place where he will issue his orders. If he assigns tasks to members of his party, he designates the time and place for the reassembly of the party.

c. Conduct of the Reconnaissance. The artillery commander seldom performs all the operations of the reconnaissance personally. While the members of his party are performing their assigned reconnaissance duties, the commander may confer with the supported or reinforced organization or he may make a general terrain evaluation of the entire area to be occupied.

d. Orders for the Occupation.

(1) Based on his own reconnaissance, reports from members of his party, and the scheme of maneuver of the supported force or the plans of the reinforced unit, the artillery commander completes his plan. He then issues the battalion order to his party and his staff. This order is usually issued orally and in fragmentary form.

(2) The battalion commander designates the release point in his order. A representative is placed in charge of this point until the executive officer arrives.

e. Movement to the Position. The executive officer alerts the organization for the move. When directed, he marches the elements to the designated release point.

4-15. Reconnaissance, Selection, and Occupation of Position From Surface March Formation

a. General. The occupation of a position from a march formation requires detailed planning prior

to the march so that personnel are alerted to the possibility of, and are aware of the requirements for, a hasty occupation.

b. Planning.

(1) Planning should be coordinated with the supported or reinforced unit before the start of the march. From a map reconnaissance, possible position areas and observation posts along the route are marked on maps and/or photographs. Manmade objects and terrain features that can be identified from the ground and that can serve as control points and as future reference points are marked with numbers. Phase lines may also be used to facilitate instructions. This procedure allows the marching unit to have prior knowledge of potential positions before the march commences.

(2) Batteries in support of marching troops may be positioned and moved successively to forward positions (leapfrogged) in order to insure that some artillery is always in position and prepared to fire in support of the marching troops.

c. Preparation. Prior to the start of the march, selected artillery personnel are furnished with maps and/or photographs that show possible locations of installations and the control measures in effect. Forward observers and liaison personnel are kept informed of this prior planning. Command liaison is established with the supported or reinforced unit.

d. Disposition of Elements During the March.

(1) The formation of a march column for movement of artillery varies with the type of unit, the mission, and the tactical situation. Column formations for nonfiring units differ from those for firing units; column formations for artillery marching alone differ from those for artillery marching as part of a march column of a supported combat unit.

(2) During the march with a supported combat unit, a reconnaissance party from the supporting artillery normally marches with the advance elements of the column. When required the chemical detection and radiological survey party of the battery CBR team is positioned with the forward element. The officer in charge of the artillery reconnaissance party reconnoiters the position areas which have been previously designated and reports his findings to the battalion commander. In addition, commanders may use aircraft for reconnaissance and security during a march. Within a supporting artillery battalion, battery commanders and their parties may march at the head of the artillery column. Figure 4-5 shows how the elements of a field artillery direct

support battalion might be disposed within an infantry march column. Figure 4-6 shows the disposition within an armored march column.

(3) Field artillery commanders, accompanied by a reconnaissance party, usually precede their units when they are part of a surface march column of a supported combat organization. Depending on his mission and knowledge of the situation, the artillery commander reconnoiters positions along the route as necessary. Frequently, the commander's knowledge of the situation will allow him to proceed directly to the position area, select the positions, and order the units into them.

e. Field Artillery Support for the Column. When enemy ground action halts the column, or when there are other requirements for immediate fire support, the field artillery battalion commander directs the appropriate batteries to occupy hasty positions and prepare to fire. The remainder of the battalion remains with the column until otherwise directed.

f. Occupation of Position. During battalion operations, the commander, a staff officer, or the battery commanders make a reconnaissance of position areas prior to the arrival of the batteries. The battalion commander continues the reconnaissance and issues the orders necessary to complete the occupation. The selection of a location for the command post is influenced by the locations selected for the battery positions, the location of the command post of the supported unit (if known), and the situation. Radio is used for communication until wire circuits are installed.

4-16. Preparation for a Night Occupation of Position

For a deliberate night occupation of position, certain preparations are made during the daylight hours preceding the occupation. The extent of these preparations are dependent on the time available and on the situation. Wire lines are laid and properly identified. Selected positions and routes are plainly marked. If possible, chiefs of sections reconnoiter routes to be used and positions to be occupied. Guides are briefed and are available to lead sections into their respective positions. Survey is established, and preparations are made for registration fires. When the situation permits, it may be desirable to move a single weapon forward for registration prior to the ar-

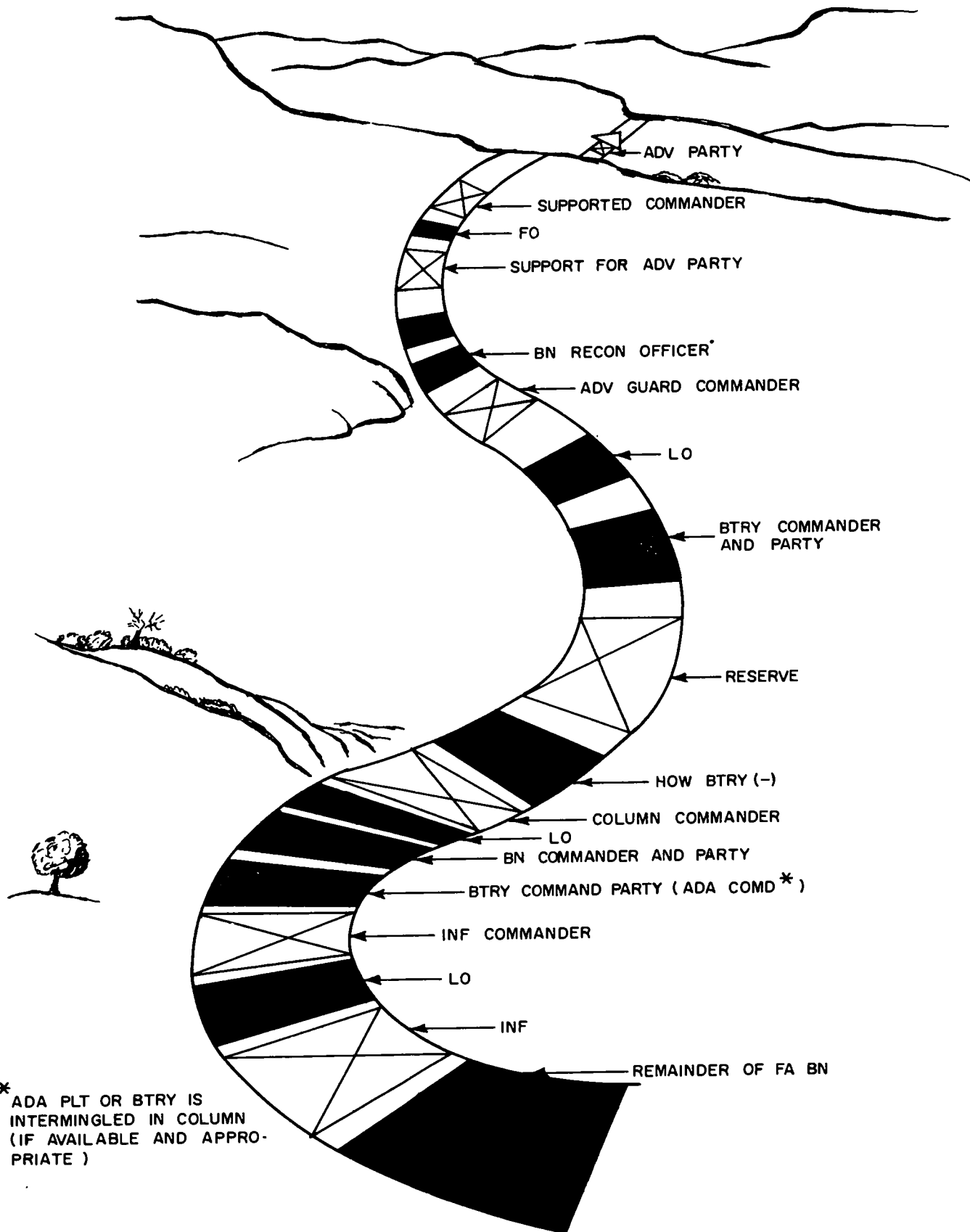


Figure 4-5. Field artillery battalion marching with infantry column.

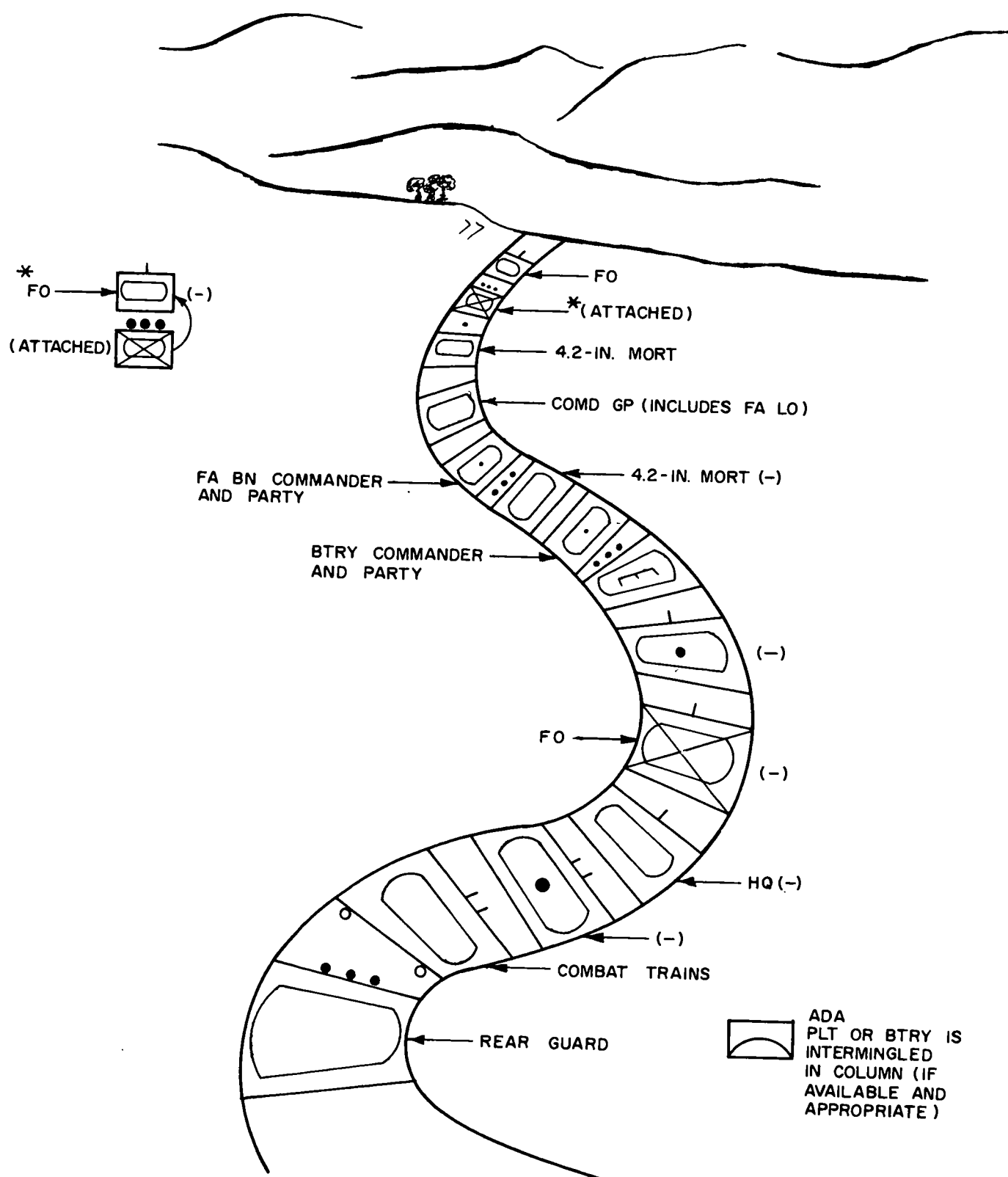


Figure 4-6. Field artillery battalion marching with armored column.

rival of the battalion. The registration may be conducted from an auxiliary position to avoid disclosing the locations of the primary firing posi-

tions. The auxiliary position should be located by survey and the survey connected to the primary positions.

Section III. DISPLACEMENTS

4-17. General

Displacements are a phase of the reconnaissance, selection, and occupation of position (RSOP). Because supporting artillery fire units must be prepared to provide continuous supporting fires, the movement of field artillery units must conform to the plans of the supported or reinforced unit. Movement may be planned well in advance or may be hasty, as dictated by an unforeseen situation. A standing operating procedure (SOP) covering RSOP must include provisions for both types of movements. Such an SOP insures uniformity in movement operations and produces maximum efficiency. A well-indexed terrain map, continuous fire planning, and liaison with the supported unit contribute to the success of a movement.

a. Planning. Timely displacements insure continuous artillery support for combat operations. Therefore, planning for artillery displacements must be continuous. The method employed in displacing the units must be one that will insure that artillery fires are continuously available to the supported unit. When a battalion displaces as a unit, the battalion commander must insure that his artillery support responsibilities are assumed by another unit for the duration of the period during which displacement will take place. The amount of time that an artillery unit is out of action for displacement should be held to a minimum. Some of the major considerations that determine the distance that units will displace and the frequency of displacements are communications, the terrain, the situation, the mobility of the units, and the range capabilities of the weapons.

b. Reconnaissance and Selection of Position. A battalion commander should continuously reconnoiter in his zone for positions, observation posts, and routes to meet any requirement. If time and the situation permit, future positions are prepared to the extent practicable. Survey control and communication may be established early. In emergencies, it may be necessary to use coordinates and altitudes directly from a map for firing data. General support missile units require more finite survey data than is required by cannon units. Directional survey requirements for missile

artillery are more stringent than for cannon artillery. For forward displacements, the battalion commander usually conducts the reconnaissance and selects positions. For displacements to the rear, the battalion executive officer, assisted by a reconnaissance party, may conduct the reconnaissance and select positions while the battalion commander remains forward with the remainder of the battalion or temporarily locates himself with the unit having the most critical need for artillery support.

c. Routes. Air observers, liaison officers, forward observers, communication personnel, and survey parties habitually report on routes within the zone of advance. Route reconnaissance parties report on the number of route markers needed, the strength and condition of bridges, and any conditions which may impede the artillery movement. Simultaneous movement of several field artillery units over the same route is usually coordinated by the higher artillery headquarters with appropriate priority. When artillery displaces over the same route used by other arms, the force commander coordinates the movement.

4-18. Displacement of Direct Support Battalions

a. General. A direct support artillery battalion is displaced on the initiative of the battalion commander and as dictated by the situation. Displacements are coordinated with the supported force. The higher artillery headquarters is notified of the method of displacement, time of commencement, expected duration, route(s) to be used, location of the new position area, and time of completion.

b. Method. The method of displacement of a direct support artillery battalion is dependent on many factors, including the situation, the time available, the plans of the supported maneuver force, the availability of other supporting artillery, the routes, and the mobility of the battalion. When reinforcing or other supporting artillery is available, it may be desirable to displace the direct support battalion as a unit, during which time a reinforcing or other artillery unit will assume the direct support role. On other occasions,

it may be necessary to displace the direct support battalion by echelon.

c. Procedures.

(1) When the battalion displaces by echelon, the battalion commander normally remains with the forward elements and the executive officer supervises activities in the rear. When a forward movement is executed by echelon during offensive action, the executive officer supervises the forward movement of elements in the rear. In defensive combat which requires retrograde movement, the battalion commander normally supervises the rearward movement of elements which have remained in the forward area.

(2) If the battalion displaces as a unit, the procedure is essentially the same as that used for the initial occupation of a position.

d. Displacement of the Command Post. There should be no interruption in command and control when the battalion displaces by echelon. Consequently, the battalion fire direction center and operations personnel are normally displaced by echelon to insure continuity of responsiveness to calls for fire. Communication is maintained at the old position and is established as early as practical at the new position. This communication includes communication with the supported unit, with the reinforcing artillery, and with higher artillery headquarters. Displacement from the old CP is initiated as soon as possible after com-

munication is established in the new position. Control normally passes to the new position when the old position element begins displacement.

4-19. Displacement of General Support Battalions

A general support artillery battalion displaces as a unit or by echelon. All displacements are directed by the higher artillery headquarters, as dictated by the situation. The battalion commander must be prepared to make recommendations concerning position areas, routes, and times for displacements. If a unit has the mission of general support-reinforcing, displacement must be coordinated with both the higher artillery headquarters and the reinforced artillery unit.

4-20. Displacement of Reinforcing Battalions

When an artillery battalion has the mission of reinforcing another artillery battalion, it displaces on request of the reinforced artillery battalion commander or on order of the higher artillery headquarters. The reinforcing battalion commander is responsible for notifying the higher artillery headquarters of the method of displacement, time of commencing the move, routes to be used, location of the new position area, and time the move is completed.

Section IV. FIELD ARTILLERY MARCHES AND BIVOUACS

4-21. References

The basic doctrine governing troop movements is presented in FM 100-5. Technical and logistical data are presented in FM 101-10. A detailed discussion of motor movements is presented in FM 6-140 and FM 55-30.

4-22. Types of Marches

a. General. The types of marches are infiltration, close column, and open column. The type of march selected for a field artillery battalion is determined by the—

- (1) Mission.
- (2) Situation.
- (3) Routes available and their condition.
- (4) Visibility.
- (5) Enemy capabilities.

b. Infiltration. When a unit moves by infiltration, vehicles are dispatched individually or in small groups and at specified intervals. The advantages of this type of march include less vul-

nerability to enemy action and less interference with other traffic. The disadvantages include excessive length of column and difficult column control.

c. Close Column. In a close column march, the unit is formed as compactly as is consistent with driving safety. The time interval between march units is usually 5 minutes. The advantages of this type of march include ease of control and reduced length of column. The disadvantages include vulnerability to enemy detection and attack.

d. Open Column. An open column is the normal tactical march column. The distance between vehicles (which is prescribed by the column commander) is normally 100 meters or more. The time interval between march units is usually the same as that for close column. The advantages of this type of march include reduced driver fatigue, better vision on dusty roads, and dispersion. The disadvantages include greater length of column and difficulty in control.

4-23. Preparation for the March

a. Orders. The amount of detail given in a march order depends on the existing situation, the state of training of the unit, and the commander's desires. Many details normally are included in a command SOP and therefore need not be included in the order. The order may be supplemented by strip maps, circulation maps, route sketches, and march tables. Each march unit commander and driver should be provided with a map or sketch of the route, if practical. The principal items that should be included in the march order are—

- (1) Situation.
- (2) Unit's mission and destination.
- (3) Organization for the march to include the order of march, the composition of the march column, and the commander of each serial, march unit, and special detail.
- (4) Specific instructions for air observers, security detachments, reconnaissance (pioneer and quartering) parties, and route marking (traffic control) parties. These instructions should include the place and time of departure, the mission of each element, special instructions, communication requirements, and the time of rejoining the main body.
- (5) Instructions for the main body to include the start point and release point (SP/RP), control points, times at which march units will arrive at and clear points, rate of march, and route(s) of march.

(6) General instructions to include route restrictions, maximum speed for units and vehicles, alternate routes and detours (if appropriate), light discipline, instructions for halts, march discipline, and precautions to be used in the event the column is subjected to enemy air or ground attack.

(7) Communication instructions for the main body to include the use of radios, messengers, signals, and panels and communication instructions pertaining to the opening and closing of command posts.

b. Route Reconnaissance. Initial route reconnaissance is usually performed by map or aerial photograph or by aerial reconnaissance; however, it may be accomplished by a ground reconnaissance. Reconnaissance by one of these means must precede each march. Reconnaissance by map, aerial photograph, or aerial reconnaissance should be followed by a ground reconnaissance whenever possible. Some field artillery units which are equipped with heavy and oversize

equipment require a more thorough and complete route reconnaissance than do other units. On some occasions, it may be necessary for pioneer parties to accompany reconnaissance parties in order to perform on-the-spot work. The purpose of route reconnaissance is to determine—

- (1) The most suitable route(s).
- (2) Alternate routes.
- (3) Available cover and concealment.
- (4) Road conditions to include surfaces, grades, defiles, fords, bridges, underpasses, and tunnels.
- (5) Locations of obstructions or restrictions (e.g., minefields, roadblocks and suspected CBR contamination.).
- (6) Sites for halts, bivouacs, assembly areas, and potential firing positions.
- (7) Requirements for route marking and pioneer work.
- (8) The distance of the route and the time required to traverse the route.

c. Quartering Party. The purpose of the quartering party is to arrange for the local procurement of necessary supplies, services, and shelter when available and to locate and lay out bivouac areas prior to the arrival of the column. The quartering party may be required to perform route reconnaissance and pioneer work and to prepare plans for the defense of the area.

4-24. Conduct of the March

a. General.

(1) To insure good march discipline, officers and noncommissioned officers ride where they can best control and supervise the march of their units. The senior person in each vehicle is responsible for insuring that all orders concerning the march are carried out. He usually rides beside the driver. The vehicles in which commanders and other designated personnel ride may be required to pass other vehicles in the column in order to supervise the move. All other vehicles maintain their positions until otherwise directed or until the circumstances dictate otherwise.

(2) Aircraft should be used to assist in column control and for the purpose of radio relay.

(3) Each vehicle commander is responsible for watching for signs, markers, signals, and other traffic. He is also responsible for insuring that the driver is alert at all times.

(4) On two-lane roads, vehicles stay well to the side of the road. Marching units which have exceptionally wide or heavy loads may have to use other designated routes which can accommo-

date the loads or may require that on-coming traffic be restrained until the column clears. Warning signs or devices must be conspicuously displayed on oversize vehicles.

b. Route Marking. The route marking detail marks the route by posting signs and/or personnel to insure that the column arrives at its proper destination without delay. Personnel used as route markers are normally posted in pairs for individual protection. They are posted at dangerous road intersections, at rail crossings, and wherever obstacles require cautious driving. When the route marking party (detail) is formed, the members of the party are given general instructions. When posted as route markers, they are given specific instructions for the posts. The duties of the route marker are comparable to those of a sentry. Provisions are made to insure the prompt pickup and return of the route markers when they are no longer needed. Details concerning traffic control and route marking are presented in FM 55-30 and FM 19-25.

c. March Discipline. March discipline is the observance and enforcement of rules which govern a unit on the march. These rules include correct formations, distances, and speeds and effective use of cover. March discipline is acquired through training and experience in marching.

4-25. Advance Guard

a. General. Artillery must provide support for the advance guard. Factors which determine the strength, disposition, and position of the supporting artillery include the size and mission of the advance guard force, the distance from the main body at which it will operate, the terrain, the enemy capabilities, and the amount of artillery available to the main force.

b. Strength and Disposition. The amount of artillery needed to support the advance guard depends on the amount available to the entire force and on the existing situation. If a battalion is the sole artillery supporting the main body, one of its firing batteries normally marches in support of the advance guard and is positioned in the column between the advance guard and the main body. When the advance guard is marching at a distance that is beyond the range of the artillery with the main body, it may be necessary to attach the supporting artillery to the advance guard. Forward observation and liaison are provided by the artillery.

c. Positions.

(1) Planning for future positions for field

artillery is accomplished by designated personnel (reconnaissance parties), who are positioned well forward in the march column. Selection of position areas for the artillery in support of the advance guard may be accomplished by the artillery commander, forward observer, or liaison officer. Artillery supporting the advance guard must not occupy position from the march prematurely; however, when needed, it must go into action rapidly. Initially, communication is by radio and voice and an observed firing chart is used.

(2) When contact is imminent and the advance guard has deployed, supporting artillery may move by bounds from one position to the next. When more than one battery is in support of the advance guard, the artillery moves by bounds by echelon with one echelon moving forward while the other is in position ready to fire.

4-26. Rear Guard

a. Strength. A rear guard force normally requires supporting artillery because of its mission. When available, self-propelled artillery is preferred. The amount of artillery support provided depends on many factors, including the size and mission of the rear guard, the amount and types of artillery available, and the existing situation. If the distance between the rear guard and the main body is excessive, supporting artillery may be attached to the rear guard.

b. Disposition and Positions. The commander of the rear guard artillery usually marches with the rear guard commander. The artillery marches between the rear guard and the main body. The principles governing the selection and occupation of positions for the rear guard artillery are similar to those for the advance guard artillery.

4-27. Flank Guard

Flank guard operations are normally supported by artillery with the main body. If the distance between the flank guard and the main body is prohibitive, it may be necessary to attach artillery to the flank guard. The principles which apply to artillery support for an advance guard also apply to support for a flank guard.

4-28. March Outposts

When a column halts during tactical operations, security detachments organize march outposts. Normally, the artillery does not occupy positions during halts of short duration. If the halt is to be

of long duration, such as for a bivouac, the artillery occupies positions from which to deliver supporting fires when needed. For security measures while in bivouac, see chapter 6, FM 6-140.

4-29. Halts and Bivouacs

a. Halts. Halts are made at specified intervals to rest personnel, to service the vehicles, and to check loads. During active operations, areas which afford cover and concealment and permit the dispersion of vehicles and personnel are preferred. The site selected should provide an opportunity for the personnel to relieve themselves.

b. Bivouacs. When troops rest under shelter tents or improvised shelter or on the ground with no overhead cover, they are said to be in bivouac. Troops are placed in bivouac only when required by the situation or when more suitable shelter is not available. Within the constraints of the tactical situation, the primary considerations in the selection of a bivouac area include security, supply, sanitation, comfort of the troops, drainage, accessibility, water supply, and protection from the weather. Locations for bivouacs are normally designated in the march order. A quartering party precedes the column to the bivouac area.

4-30. Types of Halts

a. Short Halts. The disposition of vehicles dur-

ing short halts is governed by the prevailing situation and the time involved. If vehicles are to remain on the road, they are stopped as far to the right of the road as is practical. If enemy air attacks may occur, concealment, dispersion, and the configuration of the column are primary considerations. If vehicles are to occupy areas alongside the road that were recently evacuated by the enemy, the areas should be swept for mines prior to occupation. During short halts, inspections and maintenance are performed on the vehicles. In areas where the possibility of enemy attacks (air or ground) is remote, vehicles may close on the lead vehicle in order to facilitate maintenance and inspections. Security measures for short halts are the same as those for marches.

b. Long Halts. When a battalion makes a long halt during a march, it usually occupies an assembly or bivouac area. Security measures for long halts are the same as those for bivouacs.

4-31. Sanitation

During short halts, sanitation is a minor problem. Refuse and trash are collected and buried. During long halts or in bivouac, latrines and garbage pits are constructed. Areas are kept clean, and refuse and garbage are burned or buried. When the area is evacuated, all fires are extinguished, the area is thoroughly policed, and latrines and garbage pits are filled and identified.

Section V. SECURITY

4-32. General

a. Field artillery may be attacked by enemy counterfires delivered by ground forces or air forces or combinations thereof. Such attacks may occur while units are in position or on the march. The artillery is responsible for establishing security commensurate with the means available. One of the primary considerations in positioning field artillery is the need for adequate security so that it can provide uninterrupted support to the combat elements. On some occasions, additional security from a nonorganic source may be necessary.

b. Security of position areas against ground attack becomes more critical as units disperse and gaps between units increase. Each field artillery unit, in coordination with adjacent units, establishes its own security. Dispersion may require that artillery units be positioned close to supported units in order for the artillery to benefit from the security defenses of the supported units.

In selecting positions from which to accomplish their missions, commanders must consider the defense of the area and be prepared to counter hostile action. Defilade, cover, camouflage, concealment, size of the area, location of the area relative to other units, and terrain suitable for security posts and perimeters influence the selection of positions. Consideration is also given to avenues of approach, natural obstacles, fields of fire, and routes of communication. An integrated battalion position is highly desirable, but the situation may not permit it.

c. The tactical aspects of the defense rest with the battery. However, close coordination of defensive measures by battalion is accomplished whenever possible. Individual battery defenses are integrated into a battalion defense by the battalion executive officer (who is normally the battalion security officer) when the situation permits. Emphasis is given to—

(1) Security discipline.

- (2) Camouflage, cover, and concealment.
- (3) Dispersion.
- (4) Location of weapons.
- (5) Mutual support.
- (6) Timely and adequate warning systems.
- (7) Plans to counter enemy action.

d. The duties of the battalion security officer are to—

- (1) Coordinate defenses with adjacent units.
- (2) Supervise the warning systems.
- (3) Form the battalion reserve.
- (4) Formulate the counterattack plans.
- (5) Arrange for mutual support between batteries.
- (6) Conduct rehearsals of defense plans.
- (7) Determine the adequacy of defenses.

4-33. General Defensive Measures Available to Field Artillery

a. *General.* Defensive measures are classified as either passive or active. Both types require an adequate warning system for success.

b. *Passive Security Measures.* Passive security measures are those measures taken to avoid detection and subsequent hostile action and, in the event of attack, to minimize the effectiveness of the attack. Passive security measures include—

- (1) Camouflage, cover, and concealment to obtain protection, to mislead the enemy, or to misrepresent the true identity of the installation.
- (2) Dispersion to preclude presenting a profitable target to the enemy.
- (3) Field fortifications, including foxholes, weapon emplacements, bunkers, trenches, and revetments. In many situations, overhead cover is required.
- (4) Improving natural obstacles and constructing or emplacing artificial obstacles (mines to include chemical and flame expedient, barbed wire, boobytraps, and chemical contamination).
- (5) Warning systems to include signals, sensors, observers, communications, night viewing devices, illumination, and CBR alarms or detection devices.
- (6) Dummy positions (when authorized) and roving cannon positions to mislead the enemy.
- (7) Alternate positions from which missions can be continued when it is necessary to evacuate the primary position.

c. *Active Security Measures.* Active security measures include the use of all available resources to defeat the attacker. Small-arms fires and direct fires from the primary weapons using

high-explosive and other ammunition enable the battalion to defend itself against many types of ground attacks. All personnel must be trained in infantry small-unit tactics. Fires against hostile aircraft are governed by the rules of engagement in effect. For further discussion of active security measures, see chapter 6, FM 6-140.

4-34. Security Organization

a. *General.* The defended position area includes all installations within the perimeter; that is, the firing positions and the command and service installations. It is as compact as the situation permits. The outposts form a protective screen for the perimeter and serve as detection and warning means for ground attacks. A coordinated all-round defense includes—

- (1) Proper siting of small arms to provide a continuous band of grazing fires around the perimeter, when possible.
- (2) Emplacements for antitank weapons to cover all probable avenues of approach by armored units which cannot be covered by direct fire from the primary weapons.
- (3) Defense against air attack.
- (4) Assignment of sectors of fire.
- (5) Establishment of warning systems and communications for warnings.

b. *Defended Area.* The field artillery cannon sections form the nucleus of the battery defense and are located to facilitate the accomplishment of their mission and to provide mutual support for close-in defense. Weapon sections are integrated into the defense plan by the assignment of primary and secondary sectors of responsibility to each section (fig. 4-7), the preparation of the firing position for complete coverage of the perimeter, and the development of plans to cover all possible avenues of approach.

c. *Outposts.* Outposts serve as the principal means of warning for ground attacks. During daylight hours, the outposts, consisting of observers and antitank weapons, are located to cover all avenues of approach into the position area. At night, the outposts may be pulled in to form a tighter perimeter. To be effective, the outposts require communications for the transmission of warnings and information. Outpost personnel must be briefed on the locations of friendly units and advised of necessary movements of messengers, wiremen, and other friendly personnel in the area. Observation and early warning can be further supplemented by the use of observation aircraft.

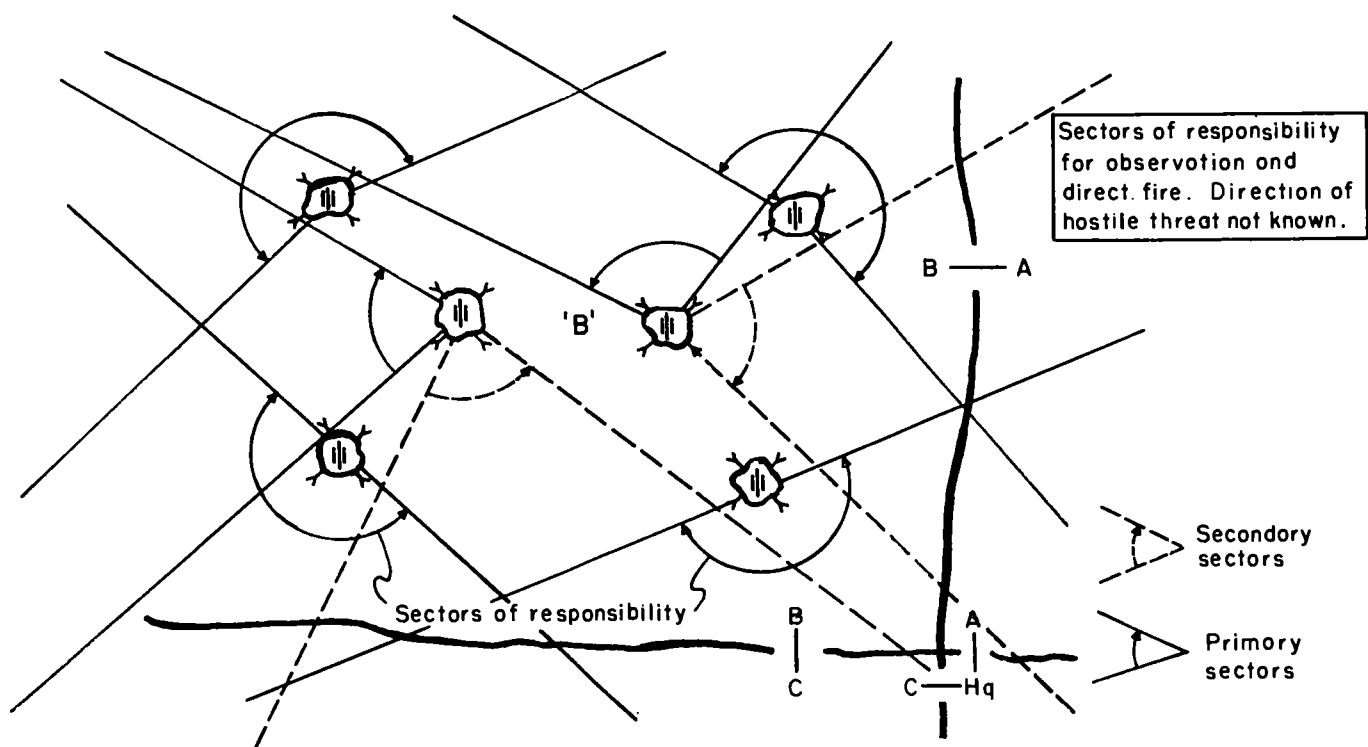


Figure 4-7. A type battery defense (schematic diagram).

4-35. Security Procedures

Certain security procedures are included in each unit's SOP. Machineguns must be mutually supporting. Sectors of fire must be assigned and stakes set out. Friendly troops who may be affected must be warned of impending close-in cannon fires or long-range automatic weapon fires. Periodic reports are required from all outposts, and unmistakable warning signals are prescribed. Mandatory precautions include the exclusion of all civilians from the position area and a positive means of identifying nonorganic military personnel in the area.

4-36. Organization of the Position

a. Initial Preparation. Some machineguns and antitank weapons are brought forward with the advance party to insure adequate defense of the area during the critical period when the battery (battalion) is moving into position. Other weapons are emplaced, camouflage is initiated, and coordination of local area security is commenced.

b. Improvement of Position. Improvement of the position area is continuous throughout its occupation.

c. Night Operations. For operations at night and during periods of restricted visibility, certain

additional precautions are necessary. Prior to darkness, ammunition is distributed and trip flares, boobytraps, sensors, flamefield expedients and mines are emplaced and armed. Strict adherence to the correct use of the challenge and reply is required. Sentries are posted, night viewing devices and sensors are used, and plans for illumination are in effect. Movement within the area is held to a minimum. Light and noise discipline are in effect. Fire of automatic weapons is controlled to prevent premature detection. All vehicles are brought into the perimeter.

4-37. Displacement Security

a. General. Field artillery is particularly vulnerable to attack during movement. The vulnerability increases when the artillery is entering or leaving a position area and when it is confined to a road where lateral dispersion cannot be achieved. The commander, in planning the defense of his column, must consider these critical phases of displacement. A night move will often reduce the vulnerability of the unit.

b. March Security. The commander, in reconnoitering a route, pays particular attention to localities favoring ambush and to areas which may be under enemy ground observation. He contacts friendly units along the route and makes ar-

rangements for communication and on-call assistance. When ground attack is possible, the column should be closed and speed increased to facilitate control, minimize the area to be defended, and expedite assembly and retaliatory action. Organic automatic weapons are equally spaced throughout the column to provide overall protection. All personnel must be prepared for immediate combat. When an air attack is expected, the terrain, the number and type of attacking aircraft, and the type of unit under attack influence the action to be taken. An effective warning system during movement may include security detachments, reconnaissance elements, communications, and observation aircraft. Paragraph 3-4b, FM 3-12 and paragraph 3-24, FM 21-40 contain information on monitoring of routes for radiological and chemical contamination.

c. Occupation of New Position. When possible,

the new position is cleared and outposts are established prior to the arrival of the main elements of the unit. In some situations, it may be necessary for the unit to establish outposts immediately upon occupation of an area. Outposts and sentries are maintained at the old area until evacuation is complete.

4-38. Nuclear Ammunition

In addition to the security measures enumerated in paragraphs 4-32 through 4-37, units with a nuclear capability must protect the nuclear ammunition and allied materials from enemy action and prevent access to such classified material by unauthorized personnel. Emergency evacuation and/or destruction procedures must be known by all personnel authorized access to such material.

Section VI. FIELD ARTILLERY COMMUNICATIONS

4-39. General

a. FM 6-10 presents a complete discussion of field artillery communications.

b. Effective artillery support depends on efficient communications. The type of communications to be used is a command decision. The commander is responsible for providing adequate communications with all elements of his command and with supported, reinforced, and adjacent units. He fulfills his responsibilities through the communication officer, who supervises communications throughout the command. The communication officer is responsible for the installation, operation, and maintenance of the communications system. He prepares communication plans and orders, supervises communication training, and advises the commander on communication matters.

c. All means of communication will be used, as required. No one means is considered primary.

4-40. Tactical Employment of Communications

a. General. The communications system to be

established in any tactical situation will always include an alternate means of communication.

b. Offense. The amount of communication established in the offense depends on the nature of the action. The rate of movement dictates the facilities to be established. Wire is employed when time permits. If radio silence or listening silence has not been imposed, radio is employed to the maximum in rapidly moving situations, since it is continuously available.

c. Defense. Normally, additional time is available in the defense and communications systems can be more completely developed. Wire systems are expanded by duplicating lines on alternate routes and by installing lateral lines to adjacent units.

d. Marches and Bivouacs.

(1) Communication during marches is necessary for warnings, march control, collection and dissemination of information and intelligence, and transmission of both tactical and administrative information.

(2) In a bivouac or assembly area, wire communication is desirable when time and the situation permit.

Section VII. ARMY AVIATION

4-41. Organization

Army aviation is utilized to expedite and improve ground combat capabilities and logistical procedures. For a detailed discussion of Army aviation, see FM 1-100, FM 6-102, and chapter 7 of this manual.

4-42. Tasks

Army aircraft capabilities include performance of the following tasks:

a. Aerial target acquisition and adjustment of fires.

b. Aerial imagery collection (photographic, infrared, and radar).

c. Route reconnaissance.

d. Wire laying, radio relay, and message delivery.

e. Evacuation of casualties.

f. Aerial inspection of camouflage.

g. Battlefield illumination.

h. Survey assistance.

i. Column control.

j. Air transport of artillery weapons, crews, and supplies.

k. Aerial observation.

l. Command and liaison activities.

m. Movement of special ammunition or components of special ammunition.

n. Tactical damage assessment.

o. Aerial delivery of fire.

4-43. Employment

The artillery aircraft normally function under

the control of the artillery commander or a subordinate unit commander within the command. Decentralization of control to subordinate artillery units allows these units freedom of utilization of aviation assets. Inherent in freedom of utilization is the responsibility for economy of use in order to avoid waste. Every effort is made to enable aircraft to operate from airfields in close proximity to supported field artillery units.

4-44. Airfields

The locations of airfields and heliports depend primarily on the tactical situation, the terrain, and the availability of necessary facilities to support aircraft. The landing areas must be free of obstacles. The length and surface of airfields must be adequate for the type of aircraft used.

CHAPTER 5

FIELD ARTILLERY FIRE PLANNING

(NATO STANAG 2029, CENTO STANAG 2029, SEATO SEASTAG 2029,
NATO STANAG 2031, CENTO STANAG 2031, SEATO SEASTAG 2031,
NATO STANAG 2088, CENTO STANAG 2088, ABCA QSTAG 108)

Section I. GENERAL

5-1. General

a. The mission of the field artillery is to provide close and continuous fire support to the force commander by destroying or neutralizing, in priority, those targets that jeopardize the accomplishment of his mission. The field artilleryman must know how to use his weapons to their full capabilities, how to organize field artillery units for combat, where to position the units, and how to plan artillery fires to support the ground-gaining arms. He must also be familiar with all types of fire support. Through the use of the fire support annex which represents the integrated, coordinated efforts of all fire support means, the fire support coordinator (FSCoord) provides the ultimate in fire support to the maneuver force. Artillery fire planning is conducted at all levels—company, battalion, brigade, division, corps, and army. Since it is the artillery's job to construct the artillery fire support appendix and coordinate all fire support on surface targets, the

field artilleryman must know the techniques and procedures involved.

b. Fire support annexes are as detailed as possible, depending on the time available, the number and accuracy of target locations, the type of operation in which the supported unit is engaged, the fire support requirements of the higher echelon, and the fire support means available.

c. Fire support and maneuver are complementary. Success in combat depends on the proper planning and execution of both fire support and maneuver. Fire support planning is a continuous process; it does not cease with the issuance of a fire support annex but continues throughout an operation.

5-2. Fire Planning Terms

Terms pertinent to artillery fire planning are listed in appendix B.

Section II. TARGETS

5-3. Types of Targets

a. Definitions and Distinctions.

(1) A target is the term used to indicate an area designated and selected for attack by fire. A target is numbered for future reference in the target numbering system.

(2) All targets are either planned (scheduled targets and available on request (on-call) targets) or are unplanned (targets of opportunity).

(a) A target of opportunity is a target which has not been planned. Since a target of opportunity is generally fleeting in nature, it should be attacked as soon as possible. It can be attacked

by shifting fire from a planned location and/or by conducting an adjustment on the target.

(b) A planned target is a target on which fire is prearranged. A planned target may be scheduled or on call. The purpose of planning is to permit accurate and timely attack of those targets capable of jeopardizing the accomplishment of the force's mission.

1. A scheduled target is one on which fire is to be delivered at a specific time. The time is specific in terms of minutes before or after a designated time or in terms of the accomplishment of a predetermined movement or task.

2. An on-call target is a planned target,

other than a scheduled target, on which fire is delivered when requested rather than at a specific time.

3. Firing data for planned targets, including the degree of prearrangement necessary must be determined by the artillery S3.

(a) Data must be kept current for those targets on which fire for effect could be called immediately; e.g., final protective fires, targets in counterpreparation fire, series of targets, groups of targets, and selected on-call targets.

(b) Basic firing data will be computed but need not be continuously kept current for those targets for which a definite time for firing has been established or will be established sufficiently in advance to allow computation of current data; e.g., preparation and harassing and interdiction (H&I) fires.

(c) Data need not be prepared in advance for such targets as terrain features or other reference points.

b. Target Symbols.

(1) The common symbol used to mark a conventional target on a fire planning map or an overlay is depicted in figure 5-1. This symbol indicates the location of the center of the target. It does not indicate the size or type of target; this information is contained in the target list. The size and type of unit to attack a target will be determined by an analysis of the target, including its size, shape, composition, and vulnerability. The symbol may be canted to facilitate plotting several targets in close proximity to each other.

(2) Targets of unusual size or shape may be marked by using special symbols (fig. 5-2). These symbols include the linear target symbol for long, narrow targets; the rectangular target symbol for rectangular targets; and the area target symbol for irregularly shaped targets. If the dimensions of the target exceed the width of an open sheaf or a depth of 250 meters, consideration should be given to creating multiple targets and including them in a group of targets, to firing zone fire, or to shifting fire.

(3) The symbol used for special weapons targets (fig. 5-3) is the tick mark. In addition to the target number, information is included as to the weapon and/or yield, delivery unit, time on target (TOT), and desired height of burst (HOB) in meters, when known.

c. Target Numbering System. The system of target numbering is explained in appendix C.

d. Group of Targets. A group of targets is two or more targets on which fire is desired simultaneously.

(1) A group of targets is graphically portrayed by circling the targets within the group and identifying the group with a group number (fig. 5-4). The FDC designates the group by using the target designation letters assigned to the artillery battalion (app C) and inserting a number between them. (Other nations may designate a group of targets by a nickname.) For example, a battalion is assigned the letters AG. The first group of targets is designated A1G; the sec-

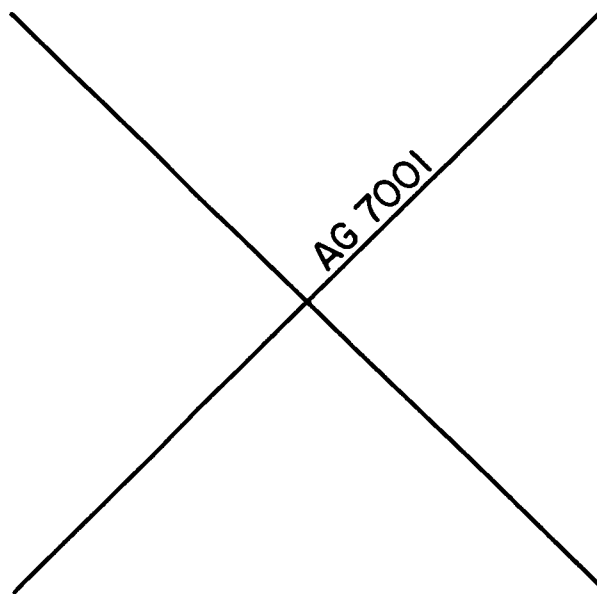
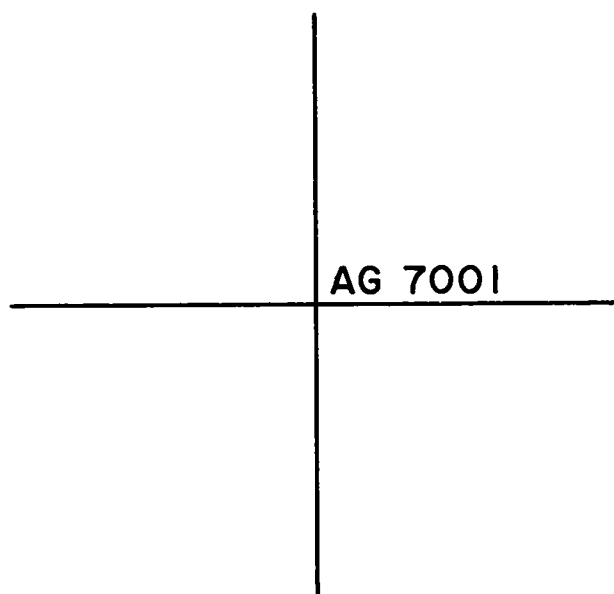
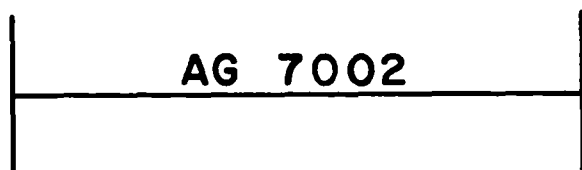
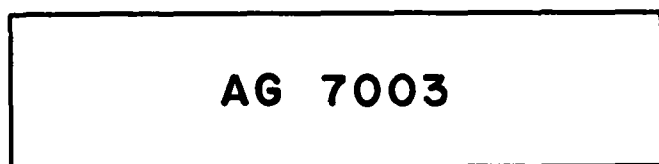
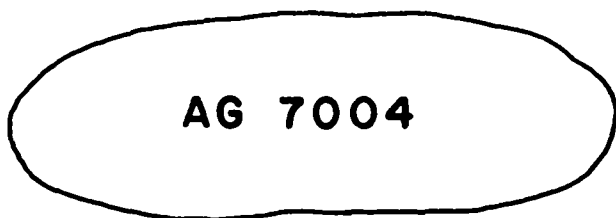


Figure 5-1. Target symbol.

**LINEAR TARGET****RECTANGULAR TARGET****AREA TARGET***Figure 5-2. Special target symbols.*

(HOB in Meters)	(Target Number)
118	3112
(Delivery Unit)	(Weapon/Yield)
A/I-10	Free Flight Rocket (FFR) /
(Time on Target)	10 KT
H-10	

Figure 5-3. Special weapons target symbol.

ond group, A2G; etc. The forward observer and/or liaison officer, seeing a need for a group of targets, will request that a group be planned by his FDC. The fact that a group of targets has been formed does not preclude the individual attack of targets within the group. The lowest artillery echelon that may form and designate a group of targets is a direct support field artillery fire direction center.

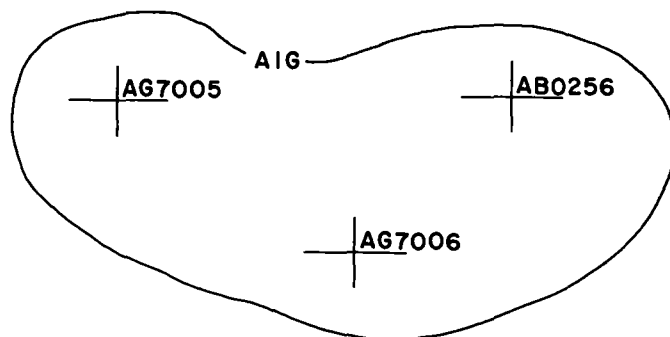
(2) When a group of targets is planned on call, firing data for the targets in the group should be kept current.

e. Series of Targets. A series of targets is a number of targets and/or groups of targets planned to support a maneuver phase.

(1) A series of targets is graphically portrayed by circling the targets and/or groups of targets within the series and identifying the series with a nickname (fig. 5-5). The fact that a series of targets has been formed does not preclude the individual attack of targets and/or groups of targets within the series. As with a group of targets, the lowest artillery echelon that may designate a series of targets is a direct support artillery fire direction center.

(2) A series might be designed to support a limited attack, a final assault, or a counterattack. It should be planned to complement the maneuver commander's scheme of maneuver. By design, the series provides intensive, prearranged fires on the objective area. It may be initiated on call, at a specific time, or when a particular event occurs. Once a series is initiated, targets and groups of targets within the series are usually fired on a predetermined time schedule listed in an artillery fire support table.

f. Program of Targets. A program of targets is a number of planned targets of a similar nature. All targets in a particular program are of the same type; e.g., a counterbattery program

*Figure 5-4. Group of targets.*

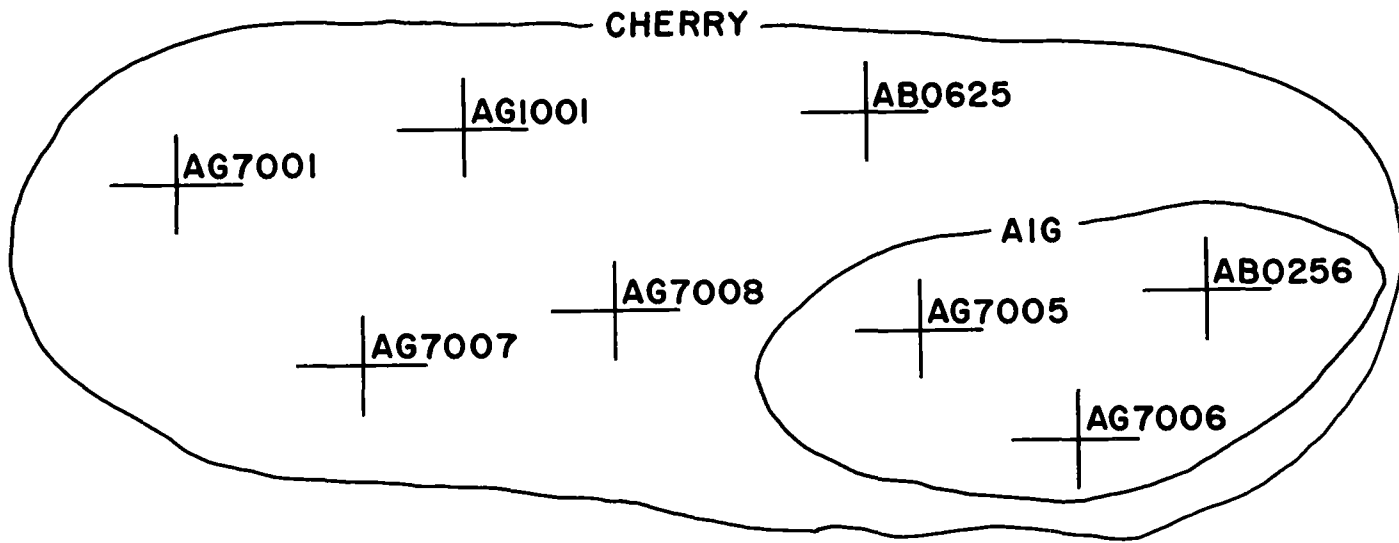


Figure 5-5. Series of targets.

planned against enemy indirect fire positions. A program of targets may be initiated on call, at a specified time, or when a particular event occurs. Once a program is initiated, targets within the program are usually fired on a predetermined time schedule listed in an artillery fire support table. A program may be designated by its nature (counterbattery) or by a nickname. The lowest echelon that normally designates a program of targets is the direct support artillery FDC.

5-4. Target Planning

Fires are planned to support the scheme of maneuver in accordance with the commander's concept of operation. Areas that should be covered by planned fires are confirmed enemy locations, suspect enemy locations, likely enemy locations, and prominent terrain features.

a. Confirmed Enemy Locations. Fires are planned on all confirmed locations of enemy forces and facilities that could hinder the supported unit's mission. This planning is done without regard to boundaries or weapon capabilities. The time of firing on known targets will depend on the tactical situation and the potential threat of the particular target.

b. Suspect Enemy Locations. Suspect enemy locations are areas where activity has been observed, but the exact nature or locations of the targets have not been determined. Suspect enemy locations also include locations that have not been con-

firmed; for example, locations contained in prisoner of war reports and shelling reports based on flash observation. Fires are planned on all suspect locations to facilitate rapid attack when a target is confirmed or when the exact nature and location of the target are determined. The time of attack is governed by the same criteria that are applied to confirmed enemy locations.

c. Likely Enemy Locations. Likely enemy locations are determined from a careful study of the terrain and available maps and from a knowledge of the enemy's methods of positioning troops and weapons. This category includes such areas as likely observation posts, troop positions, assembly areas, avenues of approach, and routes of withdrawal. Fires are planned on likely areas so that data will be available when and if the enemy occupies the areas.

d. Prominent Terrain Features. When the enemy situation is vague or there are few, if any, known or suspect targets, fires are planned on likely locations and on prominent terrain features, such as hilltops, road junctions, manmade objects, and other locations easily identified on a map and on the ground. These targets provide reference points from which fires can be readily shifted to targets of opportunity. Firing data for these targets normally are not kept current, since fires will seldom be delivered on the terrain features. The number of these targets should be kept to a minimum.

Section III. Supporting Fire

5-5. General

Supporting fire is fire delivered by artillery units to sustain the combat operations of the ground-gaining arms. There are three basic types of supporting fire—offensive fire, defensive fire, and fire which can be used in both the offensive and the defensive.

5-6. Offensive Fire

Offensive fire is fire delivered by supporting units to assist and protect a unit engaged in an offensive action. Fires in support of the offense are planned to engage targets before the preparation fire, during the preparation fire, and during the attack.

a. Fires Before the Preparation. Fires before the preparation fire include fires on targets of opportunity, fires to cover the deployment and movement of attacking troops, registration fire, and harassing and interdiction fires to restrict the enemy's movement and disrupt his command and control. Every effort is made to prevent premature disclosure of the impending attack.

b. Fires During the Preparation.

(1) Preparation fire is intense prearranged fire delivered in accordance with a time schedule to support an attack and is designed to disrupt the enemy's communications, to disorganize his defenses, and to neutralize his fire support means. Preparation fire starts before, at, or after H-hour and continues until it is lifted, either on a prearranged time schedule or on request of the assault elements. Preparation fire may include conventional and special ammunition fires of air, ground, and naval means.

(2) Preparation fire is planned even though it may not be executed. The decision as to whether or not preparation fire will be fired and the duration of the fire is made by the force commander ordering the attack. For example, in a corps attack, the corps commander would be the force commander making the decision. However, the force artillery commander makes recommendations to the force commander as to whether preparation fire should be fired and recommends a time length. The primary questions to be resolved about firing the preparation fire are:

(a) Will the effect gained offset the loss of surprise?

(b) Have a sufficient number of profitable targets been located?

(c) Is enough artillery and ammunition available?

(d) What is the enemy reaction time?

(3) When preparation fire is fired, it is normally phased to permit successive attacks on certain types of targets. Phasing should permit early attack of hostile fire support means, intermediate attack of local reserves and command and control agencies, and late attack (just before jumpoff) of enemy forward elements. Neutralization of hostile fire support means and other critical targets is made throughout the preparation.

(4) The time length of the preparation fire is specified by the force commander, based on recommendations by the force artillery commander. The time length of a preparation is based on previous combat experience, the number of targets, the amount of ammunition available, the amount of artillery available, and the desires of maneuver commanders.

(5) When the time length of the preparation fire has been announced, the artillery commander can determine by use of a formula the number of targets that can be attacked during the preparation fire. The factors included in the formula are as follows:

(a) *The number of targets to be scheduled.*

(b) *The planning time.* The planning time is the total time, in minutes, planned per target (time to shoot plus time to shift to another target). The amount of time required to fire on targets will vary. For planning purposes, an average time is selected.

(c) *The number of artillery units available to fire.*

(d) *The method of attack.* The method of attack is the number of artillery units that will fire on each target and is based on target analysis.

(6) An example problem is as follows:

Given: Time length of preparation fire—20 minutes.
Number of targets to be scheduled—Unknown.
Planning time—4 minutes.
Number of artillery units available—Five batteries.
Method of attack—one battery.

Find: The number of targets to be scheduled.

Step 1: (formula) Time length =
$$\frac{\text{No of tgts to be scheduled} \times \text{planning time} \times \text{method of attack}}{\text{No of artillery units available}}$$

Step 2: $20 = \frac{(\times)(4)(1)}{5}$

Step 3: $\frac{(\times)(4)(1)}{5} = 20$

$$\text{Step 4: } \frac{4 \times}{5} = 20$$

$$\text{Step 5: } 4 \times = 100 (5 \times 20)$$

$$\text{Step 6: } \times = 25 \text{ targets}$$

Note 1. The answer above indicates the maximum number of targets that can be scheduled in the 20-minute preparation fire (considering the other elements given).

Note 2. The units used in "method of attack" and "number of units available" must be compatible; i.e., battalions must not be mixed with batteries in the formula.

Note 3. If the planner is using one battery as a unit (method of attack) and elects to attack a target with more than one battery, he must treat that target as a multiple target; e.g., if he plans to attack a target with three batteries, he will treat the target as three targets.

(7) If desirable, the formula may also be used to determine the time length of the preparation fire. When used for this purpose, another item, reserve time, is applied to provide for additional targets received after planning has started. Reserve time will vary, depending on the rate at which new targets are received and developed at the fire direction center.

(8) An example problem is as follows:

Given: Time length of preparation fire—Unknown.
 Number of targets to be scheduled (on hand)—20.
 Planning time—5 minutes.
 Number of artillery units available—Eight battalions.
 Method of attack—Two battalions.
 Reserve time— $\frac{1}{4}$.

Find: The time length of the preparation fire.

$$\text{Step 1: Time length} = \frac{\text{No of tgts to be scheduled} \times \text{planning time} \times \text{method of attack}}{\text{No of artillery units available}}$$

$$\text{Step 2: Time length} = \frac{(20)(5)(2)}{8}$$

$$\text{Step 3: Time length} = \frac{200}{8}$$

$$\text{Step 4: Time length} = 25 \text{ minutes}$$

Step 5: Apply the reserve time to the time length to provide for additional targets ($\frac{1}{4}$ of 25 = 6.2 min).

Step 6: Add 6.2 minutes to the time length from step 4 (25 + 6.2 = 31.2 min).

Step 7: Round up 31.2 minutes to the next higher increment of planning time (5 min). Time length of preparation fire = 35 minutes.

(9) All the targets, the units to engage the targets, and the time sequences are included in an artillery fire support table. The preparation fire may be initiated on call or at a specified time as determined by the supported force commander. The scheduled sequence of targets must not be so rigid that one or more of the units cannot depart from the schedule to attack lucrative targets of opportunity or on-call targets. Units attacking these targets will reenter the schedule at the current time, *not* the time at which they left the schedule. If requested, the artillery operations of-

ficer will arrange to engage those scheduled targets that were omitted during the preparation.

(10) The fire support planner must monitor friendly maneuver progress during the preparation fire to insure that overrun targets are not attacked. Overrun targets should be deleted from the preparation fire. Of necessity, detailed coordination is required not only during the planning phase but also during the execution phase.

c. Fires During the Attack. Fires during the attack are those fires delivered to assist the advance of the supported unit. They consist of fires between the line of departure (LD) and the objective, fires on the objective, and fires beyond the objective. Fires planned in support of the attack usually consist of targets, groups of targets, and series of targets on call and may include planned targets that have been attacked previously in the preparation fire.

(1) Fires short of the objective are planned to engage hostile forces, weapons, and observation posts and thereby assist the advance of the supported force. Normally, these fires are on call and are initiated by a forward observer.

(2) Fires on the objective are planned to destroy or neutralize resistance and thereby assist the final assault. Covering fire is used to protect assaulting troops when they are within range of enemy direct fire weapons. Both planned targets and targets of opportunity should be engaged in covering fire. Groups of targets, series of targets, and programs of targets listed in artillery fire support tables and available on call are ideally suited to provide covering fire.

(3) Fires beyond the objective are planned to protect units during reorganization, to break up counterattacks, and to prevent the enemy from reinforcing or disengaging his forces or effecting resupply. These fires should be planned by the forward observer and should be considered as priority fires.

(4) Neutralization of hostile observation posts, artillery, and automatic weapons is maintained throughout the attack.

5-7. Defensive Fire

Defensive fire is fire delivered by supporting units to assist and protect a unit engaged in a defensive action. Fires in support of defensive operations are planned to engage targets before the enemy forms for the attack, after the enemy forms for the attack, and during the enemy attack and to support the counterattack.

a. Fires Delivered Before the Enemy Forms

for the Attack. Fires delivered before the enemy forms for the attack include fires that will force the enemy into early deployment, and fires in support of security forces.

(1) Fires in support of a security force (covering force) are usually planned by the highest artillery echelon with that force. Additional fire support from a general outpost (GOP) force and the main defensive force is planned to cover the withdrawal of the security force.

(2) Field artillery supporting a covering force or general outpost force usually fires initially from forward positions to prevent disclosing to the enemy the artillery positions to be used to support the main battle area. Fires in support of the combat outpost (COP) are usually planned by the artillery with the main defensive force. The time of opening fire is decided by the force commander. Premature firing from the primary positions in the main battle area will expose the artillery to neutralization and may reveal the plans of the defending force.

b. Fires Delivered After the Enemy Forms for the Attack (Counterpreparation Fire).

(1) Counterpreparation fire is intense prearranged fire delivered when the imminence of the enemy attack is discovered. It is designed to break up his formations; disorganize his system of command, communications, and observation; decrease the effectiveness of his artillery preparations; and impair his offensive spirit.

(2) The planning for counterpreparation fire should be initiated as early as possible. Counterpreparation fire is normally planned any time the force makes an extended halt. Before the command announces his concept of fire support, the fire support planner will normally select a time length for the counterpreparation fire and adjust the time length as necessary after the commander's announcement. Fires are planned on enemy troop concentrations; command, communication, and observation installations; and mortar and artillery positions. When the enemy is about to attack, his troops may be in forward positions, his artillery may have been moved forward to support his attack, and he may have stockpiled ammunition and supplies. These possibilities should be considered in planning the counterpreparation fire.

(3) Counterpreparation fire is fired on order of the force commander. The time of firing is critical. If it is fired too early, friendly artillery locations may be revealed to the enemy. If it is fired too late, the desired effect may not be

achieved. Although the force artillery commander *does not* make the decision as to when to fire the counterpreparation fire, he may be called on for a recommendation, and his units must be prepared to fire on short notice. Targets are assigned to units, and firing data are kept current. Instructions as to the number and type of rounds per target are given by the artillery planning headquarters. All the information for counterpreparation fire is included in an artillery fire support table to be fired on call.

(4) The method of computing the time length of counterpreparation fire and the number of targets to be scheduled is the same as that used for preparation fire (para 5-6).

c. Fires Delivered During the Enemy Attack.

(1) If the enemy is successful in launching his attack, fires are delivered to break up his attack and to limit his penetration. Included in these fires are the final protective fires (FPF) of the artillery and mortars.

(2) Final protective fire is an immediately available prearranged barrier of fire designed to impede the movement of the enemy across defensive lines or areas. Some of the characteristics of final protective fire are as follows:

(a) The artillery final protective fires are integrated with all the final protective fires of the force, which include the final protective fires of the machineguns and the final protective fires of the organic mortars. Final protective fire is used only in the defense. Each artillery cannon battery and 4.2-inch mortar platoon will normally be assigned one final protective fire.

(b) A final protective fire is represented on a map or firing chart by a linear plot, as illustrated in figure 5-6. The final protective fire is identified by the abbreviated designation of the unit that will fire it. The width of the final protective fire depends on the type of unit assigned to fire it. A single final protective fire of the 4.2-inch mortar platoon is, under normal conditions, 200 meters wide. Final protective fires of the 105-mm and 155-mm howitzer batteries are 200 and 300 meters wide, respectively. The depth of a final protective fire is not fixed. If necessary, the shape, or pattern, may be varied to fit the tactical situation. Because of the relatively slower rates of fire of the weapons, the 8-inch howitzer and the 175-mm gun batteries are not normally assigned final protective fires.

(c) The final protective fires of the direct support artillery are available to the supported brigade. The final protective fires of general sup-

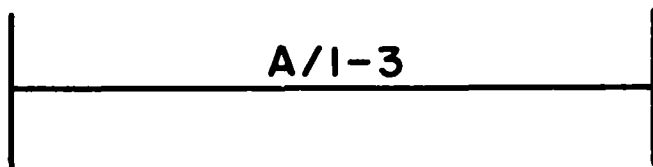


Figure 5-6. Symbol for final protective fire.

port and general support-reinforcing units *may* be allocated to committed brigades when requested. This can be arranged by modifying the affected artillery unit's tactical mission. The brigade commander designates the general areas for available final protective fires or allocates final protective fires to the maneuver battalions. The maneuver battalion commander, in turn, designates general locations for final protective fires or allocates final protective fires to the maneuver companies. The precise location of a final protective fire is the responsibility of the company commander in whose sector it falls. The coordinates of the center of the area and the width and attitude of the area are reported to the maneuver battalion and the DS field artillery battalion.

(3) The artillery forward observer has the following three responsibilities concerning the final protective fire assigned to the company with which he is working:

(a) To report the desired location of the final protective fire to his fire direction center.

(b) To adjust fire, by piece, onto the desired location (time, ammunition, and tactical situation permitting).

(c) To relay the call to fire the final protective fire to his fire direction center. The authority to call for a final protective fire is vested in the company commander and/or platoon leader in whose sector the final protective fire is located.

(4) Once a field artillery unit has been assigned a final protective fire, *it will be laid on FPF data when not engaged in other firing*. Several rounds of ammunition per weapon, with the proper charge and fuze settings, will be set aside for firing the final protective fire only. The final protective fire is fired at the *maximum rate of fire* until it is ordered lifted by the supported unit or until it has fired the prescribed time, whichever occurs first.

d. Fires Delivered in Support of the Counterattack.

(1) Fire planning to support a counterattack must be detailed and must be coordinated with the maneuver elements to insure adequate

support. A separate artillery fire support appendix should be prepared for each counterattack plan.

(2) The fire planning for a counterattack must provide for support of the counterattacking force, stopping or blunting the nose of the penetration, destroying the enemy within the penetrated area, and sealing off the base of the penetrated area to prevent reinforcement by the enemy.

(3) A division counterattack plan should provide for accomplishment of the required tasks ((2) above) in the following manner:

(a) The nose of the penetration is blunted or stopped with a combination of firepower and maneuver. The direct support battalion in support of the committed brigade will plan fires designed to stop the penetration. These fires are usually in close proximity to the maneuver unit's blocking positions.

(b) *Support for the counterattack force.*

1. The planning and execution of artillery fire support for the counterattacking force is accomplished by the field artillery unit with the tactical mission of direct support of the counterattacking force. The fire support may include a preparation fire or a series of targets and covering fires. The FSCOORD will make recommendations as to appropriate fire support coordination measures to be employed; e.g., a fire coordination line (FCL).

2. The direct support artillery headquarters will insure that plans include fires on enemy targets within the penetrated area.

(c) Planning for the sealing off of the base of the penetrated area is usually accomplished by the division artillery fire direction center. In addition, division artillery must insure that the planning in the other areas ((a) and (b) above) is complete and adequate.

e. Fires Delivered in Support of Defensive Operations. Fires are planned in the following three general areas to support defensive operations:

(1) Fires are planned *in front of friendly positions* on likely avenues of approach and on identifiable terrain features. Fire in front of the forward edge of the battle area (FEBA) is planned to engage the enemy as early as possible in order to inflict casualties, delay his advance, disrupt his organization, and destroy the integrity of his attacking force. If the fire in front of the FEBA fails to halt an attacking enemy, the final protective fires are delivered to destroy him during his assault.

(2) Fires are planned *on top of friendly po-*

sitions. If the enemy penetrates the defenses and reaches the positions, fire can be called for immediately.

(3) Fires are planned *behind the FEBA and within the battle area* to give depth to the defense, to limit penetrations, to support the counterattacks of the supported unit, and to support the withdrawal of friendly troops.

5-8. Other Types of Supporting Fire

a. Harassing fires and interdiction fires are usually planned by division and corps artilleries and are prearranged as much as possible. They are based on studies of maps, terrain, and the road nets available to the enemy and on all available target intelligence. Harassing fires are planned on known enemy positions to inflict losses, to curtail movement, and, in general, to disturb the enemy and keep him off balance. Targets suitable for harassing fire are known hostile batteries, installations, assembly areas, observation posts, communications centers, command posts, and leading elements. Interdiction fires are planned on critical areas to deny the enemy free use of these areas. Targets suitable for interdiction fire are harbors, road junctions, bridges, and crossroads. Harassing and interdiction fires (H&I) should be scheduled at irregular intervals to avoid giving the enemy a predictable pattern of fire. Deception must be maintained as to the amount of artillery and its location. Although H&I fires are normally planned at a higher artillery headquarters, direct support battalions normally participate in their firing.

b. *Counterbattery Fire.* Counterbattery fire is fire delivered for the purpose of destroying or neutralizing enemy indirect fire weapon systems.

Planned targets for counterbattery fire are included in a counterbattery program. The counterbattery program may be divided into countermortar, countercannon, counterrocket, and countermissile programs. All counterbattery targets are sent to division artillery and to corps artillery, where the counterbattery programs for the subordinate units are prepared. Counterbattery targets should be given high priority in scheduling preparation and counterpreparation fires. The counterbattery program is included in an artillery fire support table.

c. Other Fires.

(1) It may be necessary to categorize and plan other types of fires, such as counterflak or counterobservation post fire. Targets included in these types of fires are included in an appropriate program of targets (para 5-3).

(2) Counterflak fire may be fired by artillery at the request of tactical commanders to reduce interference with close air support missions, or it may be fired in support of Army aviation operations. Counterflak fire must be prearranged to insure the engagement of all known enemy air defense artillery positions within range. Air Force flak intelligence agencies and other agencies furnish the target data to artillery commanders. Requests for, and coordination of, counterflak missions are processed through fire support channels and are implemented at the artillery fire direction center.

5-9. Effects Desired

Fires are categorized as to the effect desired on a target; i.e., destruction, neutralization, harassing, illumination, and marking fires. The definitions of these terms are given in appendix B and/or AR 310-25.

Section IV. FIRE SUPPORT

5-10. Fire Support Annex

The fire support annex is identified as an annex to the operation plan. The fire support annex is prepared by the fire support element/fire support coordination center (FSE/FSCC), as directed by the supported commander, to insure complete coordination of the plan of maneuver with the plan of fire support. It is based upon the fire support portion of the commander's concept of operation and provides specific information and instructions for fire support. The fire support annex serves as the basis for preparing the fire support appendixes of the air, artillery, and naval gunfire

agencies and the fire support appendixes for chemical, and nuclear weapons when they are required. When the fire support annex, like the operation plan is approved or a date and time are prescribed for its execution, the plan is then identified as an annex to the operation order; e.g., Annex D (Fire Support) to OPORD 16. Examples of fire support annexes are shown in appendixes D, E, and P.

a. Air Fire Support.

(1) The air fire support appendix is integrated with other fire support to implement the force fire support annex and, when published, becomes an appendix to the fire support annex.

(2) The air fire support appendix is prepared by the G3 air in the tactical air support element (TASE) of the tactical operations center (TOC). This plan includes the chemical, nuclear, and nonnuclear fires to be delivered by tactical air.

(3) The air fire support appendix is not an order to the supporting air forces. When approved at corps, independent corps, or army tactical operations centers, it becomes a requirement to the tactical air forces.

(4) Targets appearing in the air fire support appendix are designated in accordance with the target numbering system shown in appendix C.

(5) An air fire support appendix is shown in appendix F.

b. Field Artillery Fire Support. The field artillery fire support appendixes are prepared at the artillery fire direction centers of the direct support battalions, the division artilleries, and corps artillery. The appendixes may include chemical, and nuclear fire planning data as to time and method of attack by appropriate units. When published, the planning for field artillery fire support becomes an appendix to the fire support annex. An example of an artillery fire support appendix is shown in appendix G. The artillery fire support appendix is discussed in greater detail in section V.

c. Chemical Fire Support.

(1) Toxic or incapacitating chemical ammunition is considered as special ammunition, as are nuclear weapons, and thus requires an allocation and authorization to expend and an announcement of the special ammunition load (SAL) for the operation.

(2) The chemical fire support appendix for a brigade is prepared by the brigade chemical officer in coordination with the fire support representatives of the appropriate delivery systems.

(3) The chemical fire support appendix for division and corps operations is prepared by the chemical representative in the FSE of the tactical operations center. The actual scheduling of the various fire support delivery systems must be coordinated with the air, artillery, and naval representatives at the tactical operations center.

(4) When published, the planning for chemical fire support becomes an appendix to the fire support annex. An example of a chemical fire support appendix is shown in appendix H.

d. Naval Gunfire Support. The naval gunfire support appendix is prepared by the naval gunfire element in the fire support element of the tactical operations center or in the FSCC as appropriate.

It is integrated with other fire support by the fire support coordinator and, when published, becomes an appendix to the fire support annex. A naval gunfire support appendix is shown in appendix I.

e. Nuclear Fire Support. The nuclear fire support appendix may be a separate appendix to the fire support annex or planned nuclear fires may be included as part of the air fire support appendix, field artillery fire support appendix, or naval gunfire support appendix. If it is a separate appendix, the planning data is given to the appropriate agency for inclusion in its planning for fire support. An example of a nuclear fire support appendix is shown in appendix J.

f. Illumination Support.

(1) When the planning for illumination support is published, it becomes an appendix to the fire support annex. The illumination support appendix consists of a written portion, a target list, a target overlay, and an illumination support table. The illumination support appendix differs from the artillery fire support appendix (para 5-13 through 5-18) in the following respects:

(a) Since the amount of illuminants in an illumination mission largely depends on atmospheric conditions, the duration of the mission, in minutes, rather than the amount of illuminants to be used, is given for each target in the illumination support table.

(b) The size of each target to be illuminated is expressed as the diameter of a circle in the size column of the target list.

(c) When an illumination mission is to be fired by an artillery unit using illuminating projectiles, the technique of illumination (i.e., one gun, two guns, two-gun deflection spread, etc.) is given in the remarks column.

(2) Illumination targets are assigned target number by the FSE/FSCC. A block of numbers may be reserved for illumination targets.

(3) There is no prescribed format for the written portion of the appendix. It should contain available information concerning the use of illumination in support of the operation.

(4) Coordination is accomplished at all echelons to insure integration of battlefield illumination with fire support means.

(5) For an example of an illumination support appendix, see appendix K. For request channels, see figures 5-7, 5-8, and 5-9.

5-11 Fire Planning Channels

a. Fire Planning Levels. Fire planning within

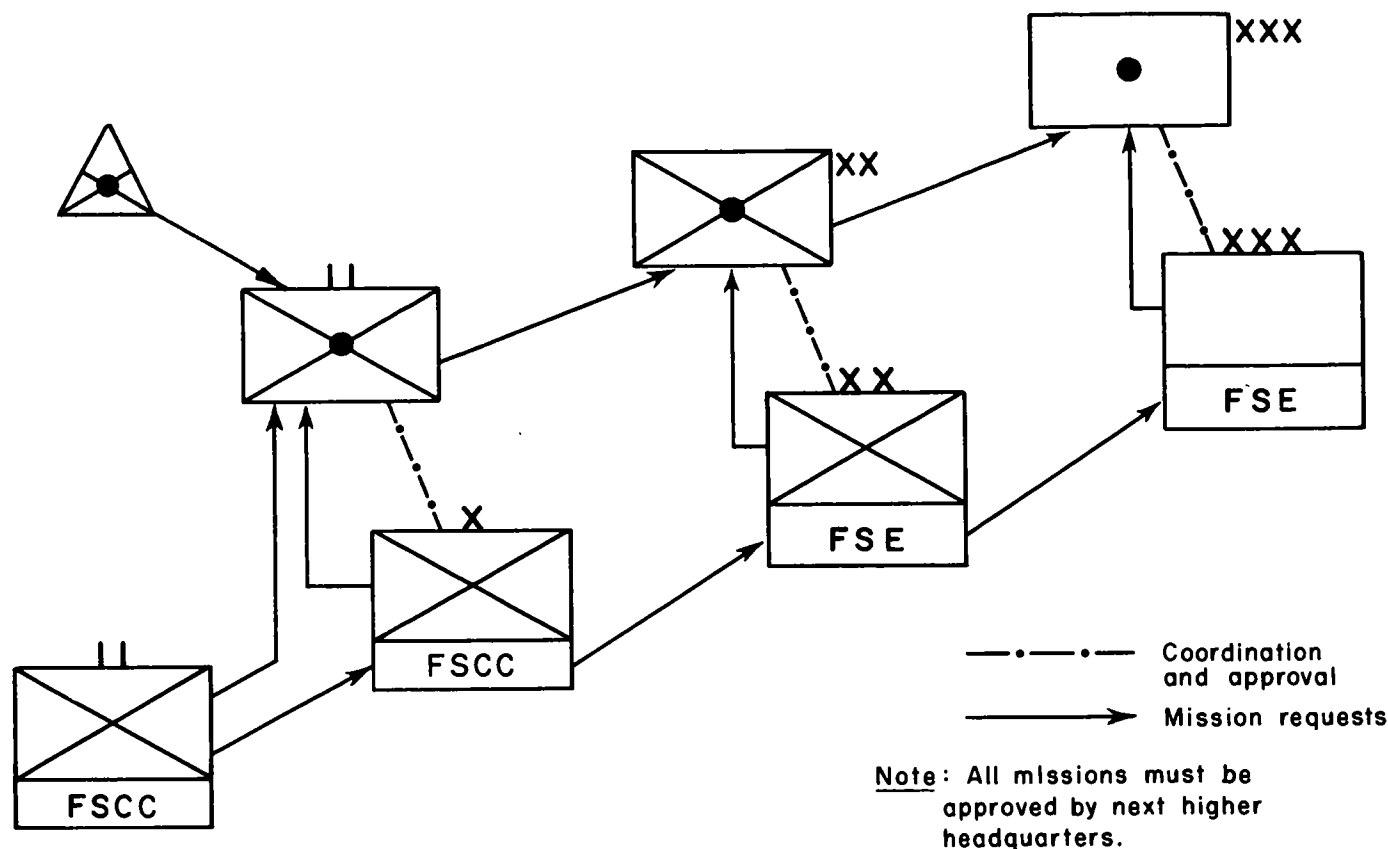


Figure 5-7. Artillery and searchlight illumination request channels.

the artillery is continuous and concurrent. It takes place at all levels, from the forward observer through the highest echelon. Close coordination between field artillerymen/fire support coordinators and supported commanders is necessary at all levels. Fire planning channels are shown in figures 5-10①, 5-10②, and 5-11①, 5-11②.

b. Commander's Concept of Operation. Concrete planning is initiated upon receipt of the decision and the force commander's concept of operation, which includes the plan of maneuver and plan of fire support. The commander's concept of operation, which may be verbal or graphic, outlines the overall picture of the intended operation.

c. Company Level. The forward observers (field artillery, 4.2-inch mortar platoon, and 81-mm mortar section) are briefed by the maneuver company commander concerning the company's mission, plan of maneuver, and plan of fire support. Using data obtained at this briefing as a basis, the forward observers plan fires. The field artillery forward observer submits his target list to the field artillery liaison officer (FSCOORD)

at the maneuver battalion. The 4.2-inch mortar platoon forward observer submits his list to the 4.2-inch mortar platoon fire direction center. The 4.2-inch FDC consolidates the target lists from the three rifle companies and it is then forwarded to the artillery liaison officer at the maneuver battalion headquarters. The target list of the 81-mm mortar platoon forward observer normally remains at company level. The artillery liaison officer at the maneuver battalion headquarters coordinates and consolidates the target lists and forwards the consolidated list to the artillery battalion. *Coordination at company level* (company commander and all observers) is of prime importance. The company commander is the FSCOORD. Proper coordination at company level (fig 5-10①) increases fire planning efficiency at all higher levels.

d. Maneuver Battalion Level. The artillery liaison officer (FSCOORD) with the maneuver battalion is responsible for preparing the target list and fire support requirements of the maneuver battalion. He does this by combining the targets of the artillery forward observers working under him, appropriate targets from the target list of

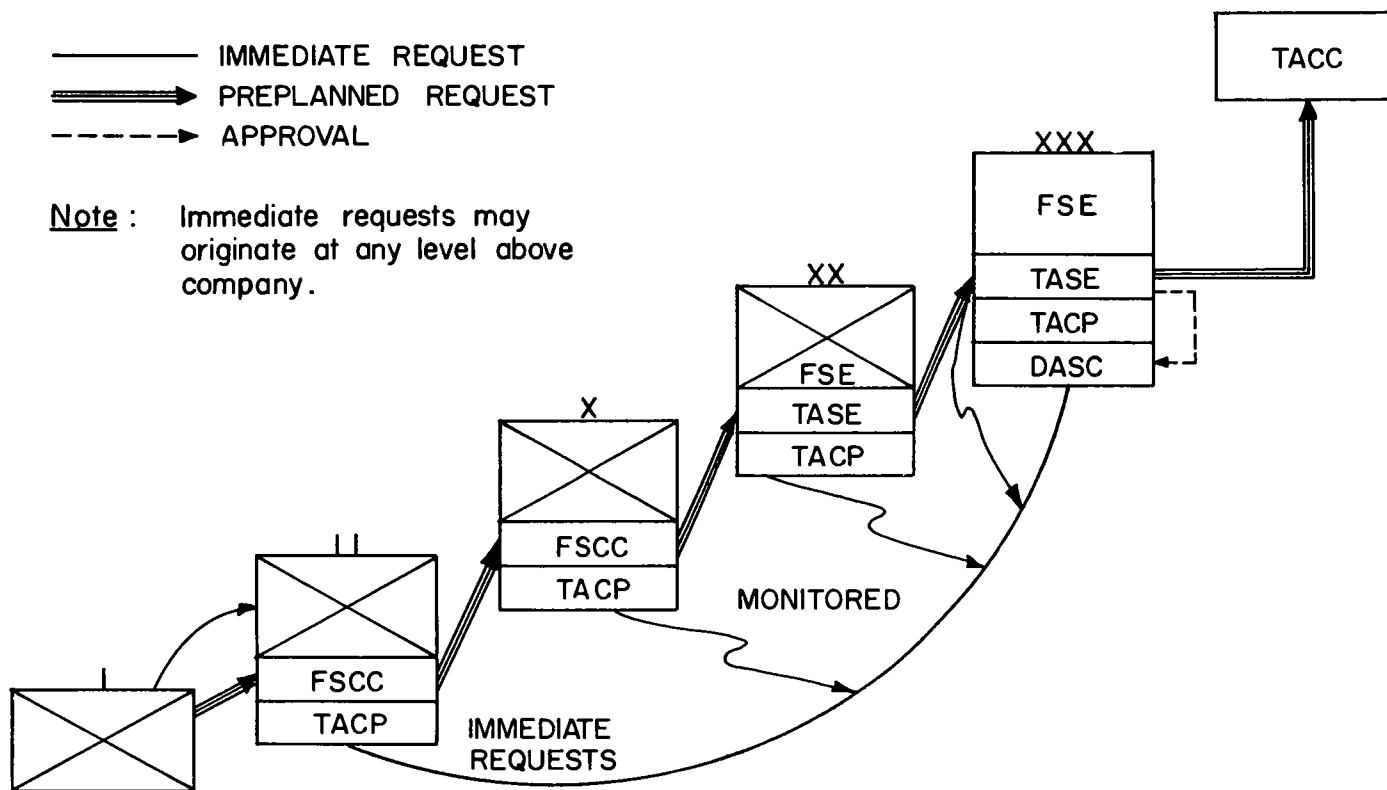


Figure 5-8. Tactical air illumination request channels.

the heavy mortar platoon, and the targets developed by the maneuver battalion commander or members of his staff. The latter targets may include targets beyond the company objectives and those emphasized by the battalion commander in his concept of operation. The 4.2-inch mortar platoon targets and fire support table are checked by the FSCOORD against the artillery targets. Duplications are resolved. The FSCOORD may include 4.2-inch mortar targets in his artillery target list when additional fires are needed. After the duplications have been resolved and the target lists have been consolidated, the forward observers are informed of the approved targets and of any changes to their lists. The FSCOORD may assign target numbers himself, or he may allocate portions of his block of numbers to his forward observers. After targets are received and duplications resolved, the target lists and fire support requirements are approved by the maneuver battalion commander and in the form of a fire support annex are sent immediately to the direct support (DS) artillery battalion fire direction center/operations and to the brigade FSCC.

e. Direct Support Artillery Battalion Level.

(1) The focal point for artillery fire planning at brigade level (fig. 5-10②) is the direct support artillery battalion fire direction center. The artillery battalion S3 consolidates the planned use of available and immediately responsive artillery. He receives target information, fire support requirements, and guidance from several sources to include the brigade liaison officer. Target information is also received directly from division artillery, adjacent units, the organic counter-mortar radar unit, and other artillery target acquisition agencies. The S3 prepares the direct support battalion's plan for artillery fire support and forwards it to the brigade commander for approval and signature. An information copy is sent to division artillery. Requests for additional fires are also forwarded to division artillery.

(2) The direct support artillery battalion may be requested by brigade to plan the fires of the heavy mortars. In this case, each heavy mortar platoon may be allocated targets in the artillery fire support table.

(3) When approved, the direct support artillery battalion fire support appendix is distributed to the firing batteries, to all the liaison officers, to

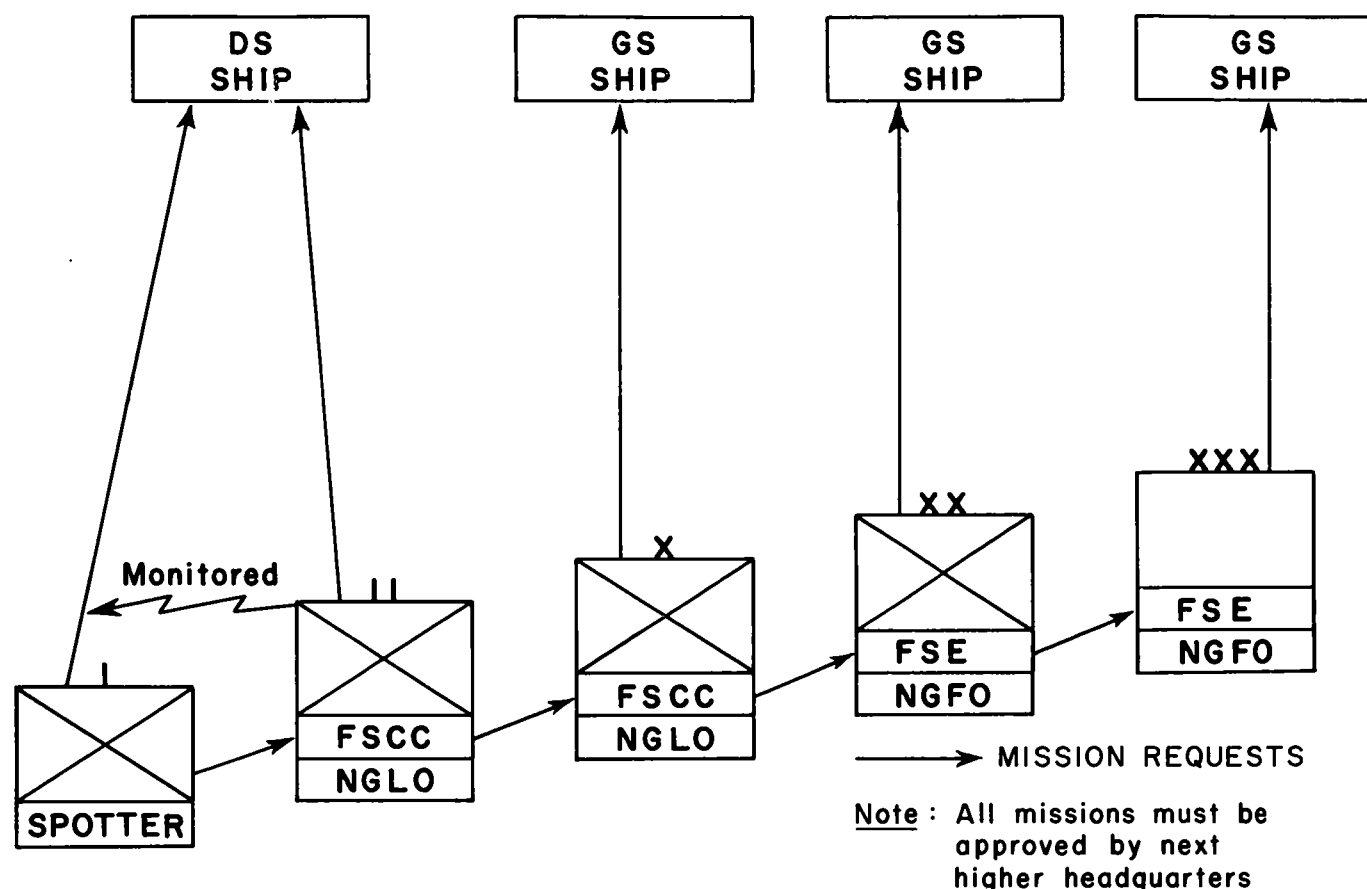


Figure 5-9. Naval gunfire illumination request channels.

division artillery, and to reinforcing and adjacent artillery. The liaison officers at maneuver battalion level notify the forward observers of the fires planned in their sectors.

f. Division Artillery Level.

(1) At division artillery level (fig. 5-11ⓐ), the S3 prepares the artillery fire support appendix to support the division, based on the division commander's concept of operation and his concept of fire support.

(2) The division artillery fire support appendix is developed from the requests of subordinate artillery units and corps artillery and from the fire support requirements of the division. The objective of the division artillery fire support planning is coordinated artillery fire support for the entire division area.

(3) The division artillery fire support appendix is initiated by planning fires for the division general support artillery and for other artillery supporting the division artillery on targets requested by, or beyond the range of, direct support artillery and on targets of interest to the di-

vision as a whole. Fire plans of direct support artillery are augmented when necessary by general support and reinforcing fires, and these plans are integrated with the fire support appendix of the division artillery.

(4) Coordination is effected with the lower echelons of the force if fires are planned within the zones of responsibility of the lower echelons or if the operations of the lower echelons are affected.

(5) Targets which are incapable of even limited interference with the division plan of maneuver are sent to the S2 of the direct support artillery battalion concerned for consideration for attack at that level. Targets out of range of division artillery are sent to corps artillery. Targets short of the no-fire line (NFL) are coordinated with the direct support artillery battalion concerned. Targets obviously unsuited for artillery attack are sent to the division fire support element for possible attack by other fire support means.

(6) All counterbattery-type targets are sent

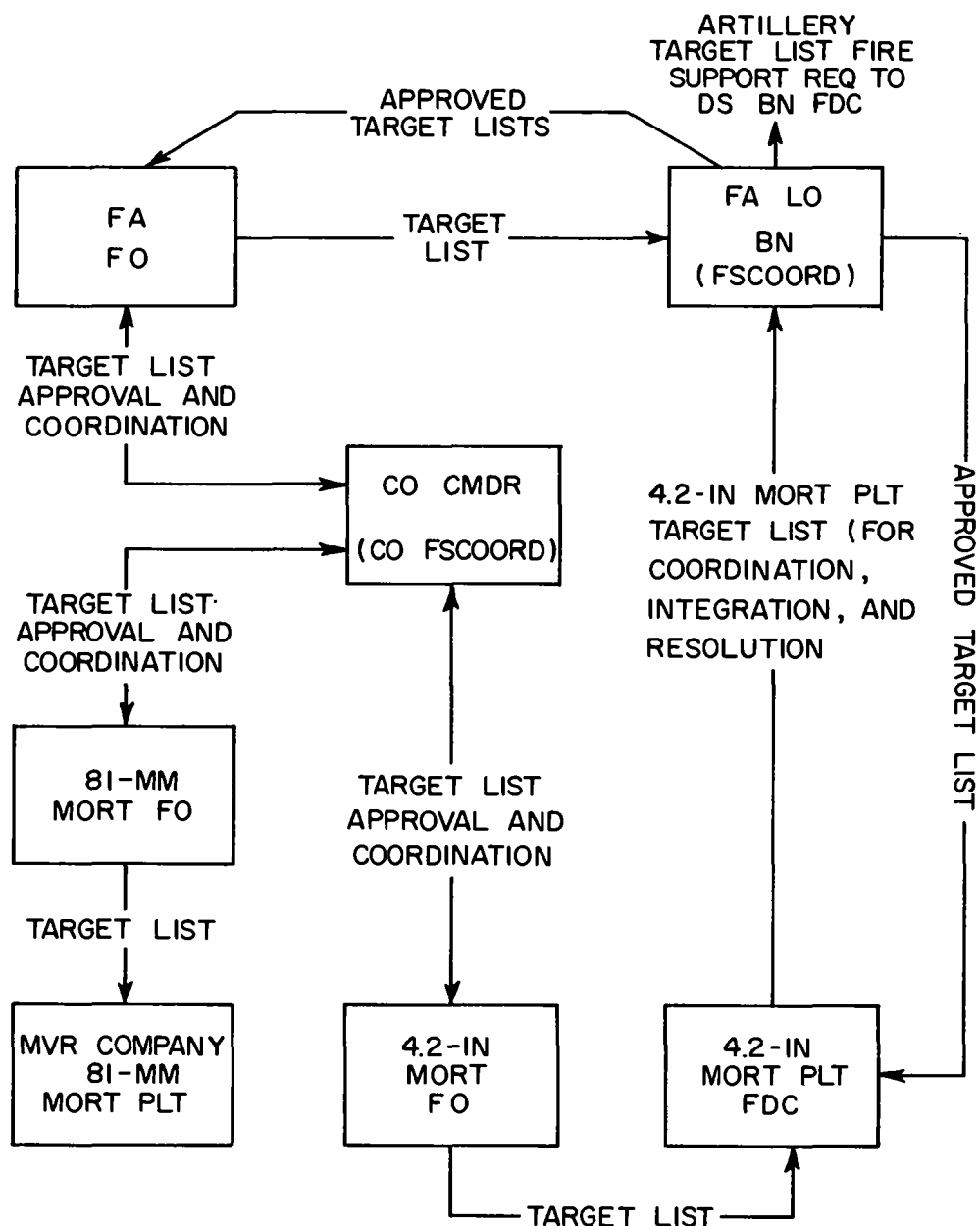
to division artillery and to corps artillery. Division artillery and corps artillery prepare the counterbattery programs for their subordinate units.

(7) Division artillery checks the fire support appendixes submitted by the direct support artillery to eliminate duplications, to resolve conflicts, and to insure that the plans are completely integrated with the division artillery fire support ap-

pendix. The fire support appendix at division artillery will normally provide for counterflak fires, harassing and interdiction fires, preparation fires, counterpreparation fires, and counterbattery fires.

(8) Upon completion, the division artillery fire support appendix is sent to the fire support element of the division tactical operations center where these fires are compared with those

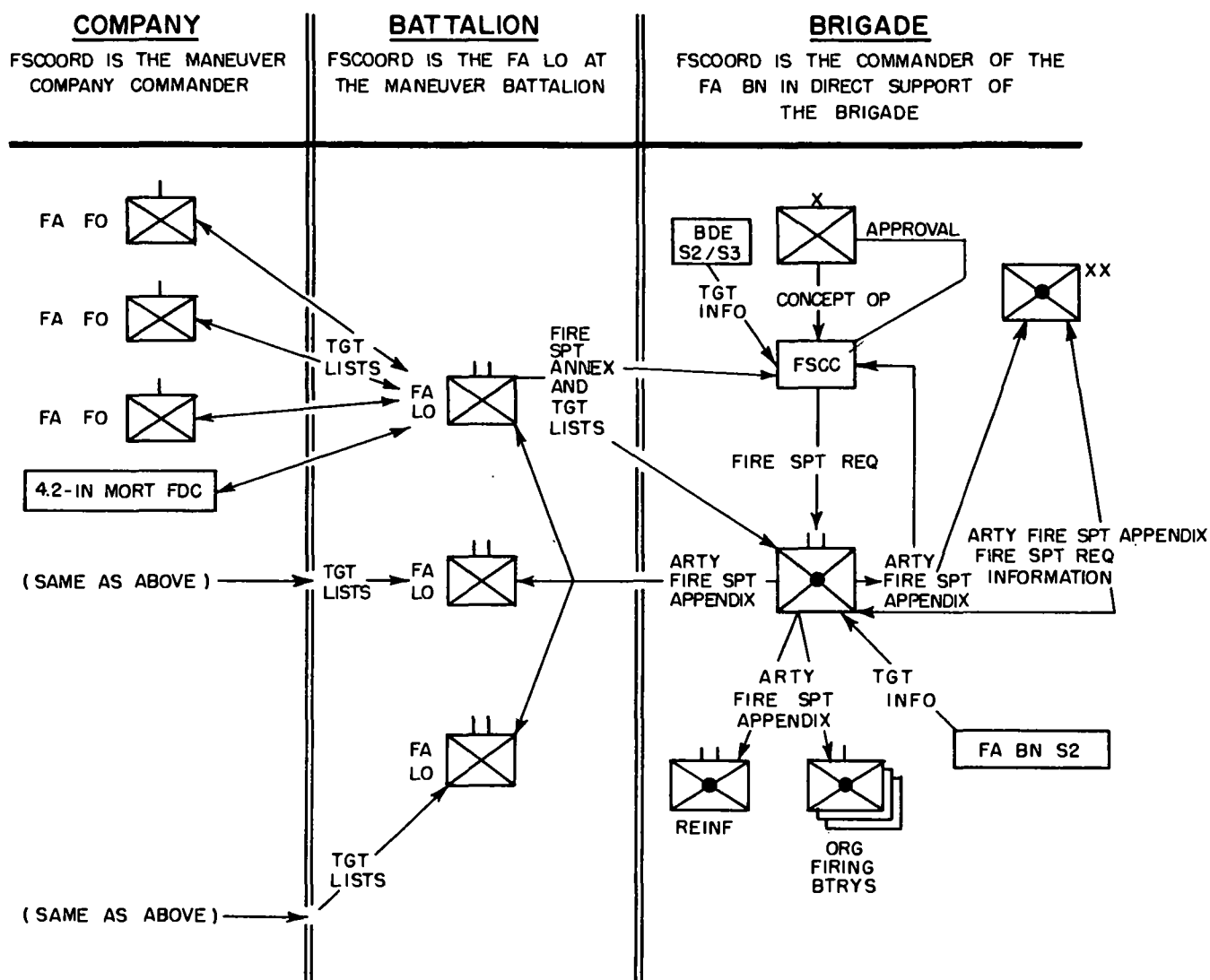
FIRE PLANNING CHANNELS (COMPANY LEVEL)



① Company level.

Figure 5-10. Fire planning channels.

FIRE PLANNING CHANNELS (BRIGADE LEVEL)



② Brigade level.
Figure 5-10—Continued.

planned for other fire support means. It is then presented to the division commander or his designated representative for approval and signature. Copies are then sent to reinforcing artillery, corps artillery, adjacent division artilleries, and subordinate artillery units.

g. Corps Artillery Level.

(1) Preparation of the detailed corps artillery fire support appendix (fig. 5-11②) starts with planned fires in the corps zone on hostile artillery locations, targets beyond the range of division artillery, and targets of importance to the corps as a whole.

(2) Artillery fires requested by lower echelons are included in the corps artillery fire support appendix.

(3) The corps artillery fire support appendix is modified to meet changes in the situation. The appendix will normally include harassing and interdiction fires, preparation fires, and various other programs of targets to include counter-battery fires.

(4) Coordination is effected with the lower echelons of the force if fires are planned within the zones of responsibility of the lower echelons

or if the operations of the lower echelons are affected.

h. Field Army Level. The army field artillery is responsible for planning for fire support for field artillery directly under army control. The army field artillery support is coordinated with the corps' plans, the air fire support appendix and the naval gunfire support appendix.

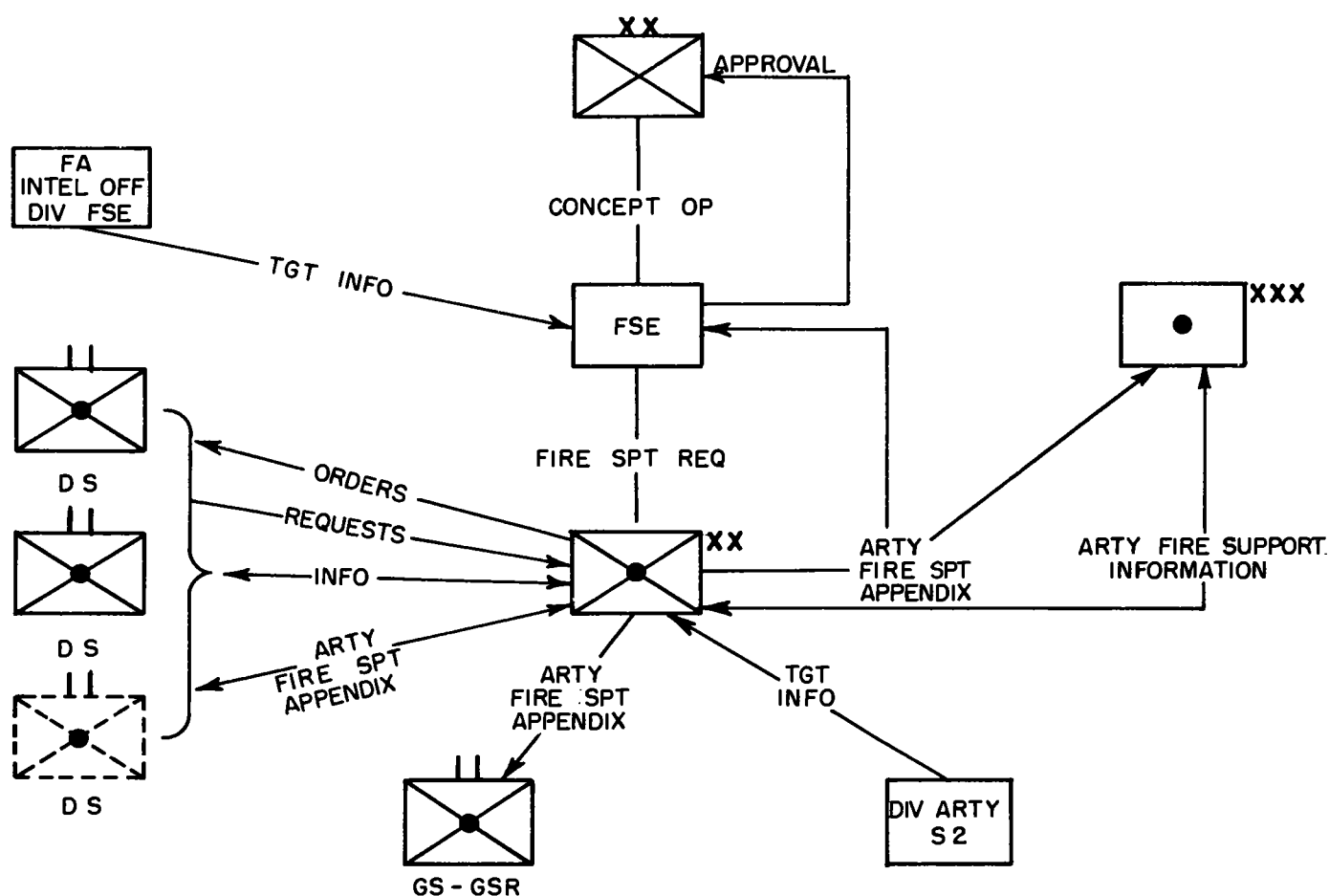
5-12. Concurrent and Continuous Fire Support Planning

a. Fire support planning at all levels is con-

ducted concurrently and continuously. It does not cease when a formal fire support annex is published and disseminated. Additions, deletions, and changes continually flow through fire planning channels.

b. Development of fire support at one echelon should not be delayed pending receipt of plans for fire support from another echelon. This continuous coordination permit plans for fire support to be developed concurrently at all echelons. It is only by the use of these techniques that fire support planning can be timely.

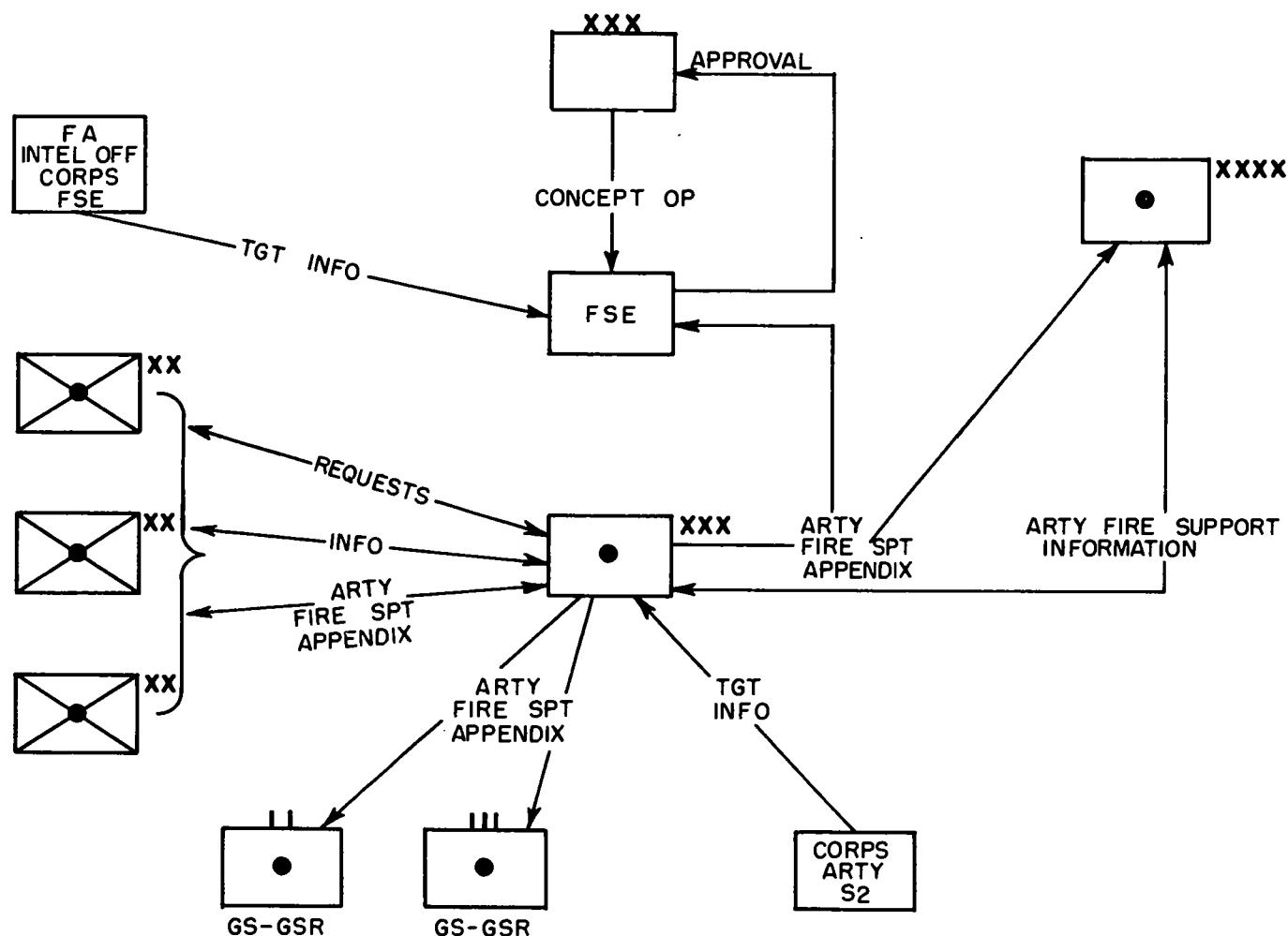
FIRE PLANNING CHANNELS (DIVISION ARTILLERY LEVEL)



① Division artillery level.

Figure 5-11. Fire planning channels.

FIRE PLANNING CHANNELS (CORPS ARTILLERY LEVEL)



② Corps artillery level.
Figure 5-11—Continued.

Section V. ARTILLERY FIRE SUPPORT

5-13. General

a. The artillery fire support appendix is a tactical plan for coordinating and employing the fires of an artillery unit. The artillery fire support appendix enables the artillery commander to—

(1) Define targets assigned or those which can be assigned to units under his authority or whose fires are placed at his disposal.

(2) Allocate targets to his units.

b. When the appendix for artillery fire support is approved or a date and time are prescribed for

its execution, the appendix is identified as an appendix to the fire support annex; e.g., Appendix 2 (Artillery Fire Support) to Annex D (Fire Support) to OPORD 16.

c. The artillery fire support appendix consists of a written portion, a target list, a target overlay, and one or more fire support tables. The target list, target overlay, and fire support tables become tabs to the artillery fire support appendix. An example of an artillery fire support appendix is shown in appendix G.

5-14. Written Portion of the Artillery Fire Support Appendix

a. The written portion of the artillery fire support appendix is the basic document. It has the standard heading and ending similar to those of the operation order.

b. The written portion includes that information which is necessary in understanding the fire support appendix and any other special information on the employment of artillery fire in support of the operation or any phase of the operation to which the fire support appendix will apply. Examples of this information are—

(1) The plan of maneuver or plan of defense of the supported unit.

(2) The priority of fires.

(3) Requests to higher headquarters for additional fire support.

(4) Requests for special missions (e.g., destruction missions) and requests for clearance for fires outside the zone of the supported unit. However, action to obtain clearance for fires outside the supported unit's zone should be accomplished at the earliest practicable time; the S3 should not wait until a formal fire support appendix is prepared.

(5) Any pertinent information concerning the employment of the supported unit's organic weapons (e.g., mortars) or any other firepower available to the force (e.g., tanks in an indirect fire role).

(6) Methods of attack of scheduled or on-call targets to include the type of ammunition and fuze required.

c. The heading indicates the maneuver unit supported. The ending of the original copy bears the signature of the commander of the supported force; all other copies are authenticated by the supported force G3 (S3).

d. There is no prescribed format for the information contained in the body of the written portion.

5-15. Target List

The target list (tab A, app G) is a compilation of targeting data planned to support an operation. The target list contains the following data, as appropriate, for each target listed:

a. *Target number.* Each target is given a target number.

b. *Description.* The target may comprise gun sites, dugouts, assembly areas, batteries, observation posts, personnel, command posts, etc. It may be in the open, sheltered, or underground.

c. *Location.* Targets are normally located by grid coordinates to the nearest 10 meters. The reference system used must be specified at the top of the target list.

d. *Altitude.* The altitude (height) of the target is always given in meters.

e. *Size.* The target may be a—

(1) *Pinpoint or comparable target.* No dimension is given.

(2) *Linear or comparable target.* The length is given.

(3) *Rectangular target.* The length and width are given.

(4) *Circular target.* The center point and radius are given.

f. *Attitude.* The attitude of the target is expressed in mils of angular deviation from grid north unless otherwise specified and must be given for—

(1) A linear target.

(2) A rectangular target. The attitude of the greater dimension is given.

(3) Deliberate smoke missions.

g. *Source and/or accuracy (optional).* If required, the source and/or accuracy of the information concerning the location of the target is specified.

h. *Remarks.* Special considerations for the engagement of the target and further amplification of the description of the target may be included in the remarks column.

Note 1. If the target is measured in units other than meters and mils, the reference system must be specified at the top of the target list.

Note 2. The target list includes five work columns, which are used to indicate the targets that are to be included in a specific artillery fire support table.

5-16. Target Overlay

a. The target overlay (tab B, app G) supplements and confirms the target list. It is a graphical display of targeting data.

b. Targets are identified on the target overlay by symbols and target numbers. The symbols should agree with those in figures 5-1 through 5-6 and in STANAG 2019 and FM 21-30. Since reproduction of the overlay may cause inaccuracies, the locations given in the target list are considered to be more accurate than those shown on the overlay.

c. A group of targets (para 5-3d) is represented by a line encircling the targets concerned and is identified by a letter/number combination.

d. A series of targets (para 5-3e) is repre-

sented by a line encircling the targets and/or groups of targets concerned and is identified by a nickname or code name.

e. When time and resources allow, the target overlay is replaced by a map on which targets are plotted directly.

5-17. Artillery Fire Support Table

a. The artillery fire support table (tabs C and D, app G) shows the targets assigned to units. In addition, it specifies—

(1) The starting time and duration of fire on each scheduled target.

(2) The total expenditure of ammunition by each unit in each target.

(3) The type of ammunition to be fired on each target.

(4) On-call targets.

(5) The time for opening fire. The artillery fire support appendix may be fired on order, at a predetermined time, or when a specific event occurs.

(6) Any special instructions.

b. For each phase of an operation, the following may be prepared:

(1) Artillery fire support tables comprising the following categories of targets and fires:

(a) Groups of targets.

(b) Series of targets.

(c) Programs of targets.

(d) Preparation fire.

(e) Counterpreparation fire.

(f) H&I fires.

(g) Illumination fire.

(2) Instructions for other types of fires.

c. The items of information required in an artillery fire support table are amplified in (1) through (7) below.

(1) For each target to be fired, except targets to be engaged by use of the time-on-target (TOT) technique—

(a) Indicate by use of a horizontal line the starting time and duration of fire.

(b) Enter the target number above the line.

(c) Enter the number of rounds of ammunition to be fired by the unit below the line. (Rate to be expressed as the number of rounds per gun per minute, prefixed by the word "Rate".)

(d) Enter additional remarks, as appropriate, in the remarks column.

(2) For each target to be engaged by use of the TOT technique, enter in the artillery fire support table the target number, the number of

rounds to be fired, and the time at which the target is to be engaged.

For example:

-12	-10	-8	Remarks
AF2021			
24(c)			(c) TOT H-12

(3) Targets shown in the artillery fire support table may be scheduled or on call.

(4) Targets will be assigned to a unit and may be fired singly as part of a series of targets or as part of a group of targets. Each target in a group of targets will be assigned to a unit in such a manner as to permit simultaneous engagement of all targets in the group (series). Simultaneous engagement does not mean that the time-on-target technique must be employed.

(5) The artillery commander concerned determines the smallest artillery unit to be shown in the artillery fire support table. The size of the smallest unit to be shown depends on the level at which the table is prepared. When the artillery fire of non-U.S. units is included in the artillery fire support table, considerations is given to particular national characteristics in regard to organization and procedure.

(6) Unless otherwise indicated in the artillery fire support table, targets must be engaged with fuze quick, high explosive ammunition. If a target is to be engaged wholly or partly with any other type of ammunition, such as smoke shells or proximity fuzed shells, this must be specified in the remarks column.

(7) If necessary, instructions for registration and/or adjustment are specified in the written portion of the artillery fire support appendix if they are not already shown in an operation order or fire support annex. When fire is to be directed in the proximity of friendly troops, the position of the friendly troops will be shown on the target overlay.

5-18. Artillery Fire Support Appendix Construction

The procedure for constructing an artillery fire support appendix is given in *a* through *g* below. The procedure applies to fire direction centers at all echelons.

a. Plot the units and their range and traverse capabilities on an overlay to be affixed to the fire planning map.

b. Plot targets and designate other targets as appropriate.

c. Resolve any duplication of targets.

d. List the targets received from the planning sources on the target list.

e. Select the targets to be scheduled and the method of attack, using the work columns of the target list.

f. Prepare an artillery fire support table for those targets to be fired in accordance with a time schedule; e.g., preparation fire, counterpreparation fire, series of targets, programs of targets, and H&I fires. Also prepare an artillery fire support table for groups of targets.

g. Prepare the written portion.

5-19. Quick Artillery Fire Support Plan

a. A quick artillery fire support plan provides the necessary information to enable—

(1) The originator to plan fires and to transmit to all concerned (by radiotelephone if necessary) the details of the quick artillery fire support plan.

(2) Fire direction centers and command posts to execute the fire support plan.

b. The format of a quick artillery fire support plan conforms, as far as possible, to the format of an artillery fire support table.

c. The quick artillery fire support plan includes—

(1) Identification of the originator and the supported unit, nickname, and H-hour.

(2) Details for the engagement of targets, which are displayed in the same manner as in the artillery fire support plan table, to include—

(a) Formation or organization and firing unit.

(b) The starting time and duration of fire on each scheduled target.

(c) The total expenditure of ammunition and the type of ammunition to be fired.

(d) On-call targets.

(e) Special instructions.

(3) A list of all targets to be engaged to include—

(a) The target number.

(b) The grid coordinates and description of each target.

d. The quick artillery fire support plan is designed to be used by the artillery liaison officer at the maneuver battalion/brigade level for rapid fire planning in unexpected situations; e.g., when the maneuver battalion (brigade) must make a quick attack or counterattack. Using the targets reported by his forward observers and by the maneuver battalion, the liaison officer compiles a list of targets and transmits the target data to the direct support battalion fire direction center. The fire direction center arranges the targets to be scheduled and those to be placed on call in the artillery fire support table and transmits the information to the artillery liaison officer, who enters the data in the appropriate portion of his quick artillery fire support plan.

e. The quick artillery fire support plan may also be used by the artillery liaison officer at the maneuver battalion to transmit the scheduled and on-call targets to his forward observers.

f. An example of a quick artillery fire support plan is in appendix L.

Section VI. TARGET ANALYSIS

5-20. Prestrike Analysis

a. Target analysis is the examination of a target to determine its military importance, its priority for attack, and the capabilities of available weapons for attacking the target. Targets of opportunity, as well as planned targets, are analyzed.

b. All targets are analyzed as soon as they are located. For a target of opportunity, the analysis may consist of no more than a rapid mental calculation by the appropriate artillery echelon to insure timely, accurate, and effective fires on the target. For a target on which fires are planned for some future time, the target analysis is more deliberate. The length of time and the amount of detail involved in making a target analysis depend on the amount of information available con-

cerning the target, the means available and suitable for attack of the target, the degree of coordination required, and the urgency for attacking the target. FM 6-141-1 is a valuable aid in determining the method of attack.

c. For nuclear target analysis methods, see FM 101-31-series.

d. For chemical target analysis, see FM 3-10.

5-21. Mission of Supported Force

a. The basic consideration in making a target analysis is the concept of operation and priorities for fire support as announced by the commander. Supporting firepower is employed to aid in the accomplishment of the mission. The importance of the target, measured by its capability to influence the operation, is a major consideration.

b. Because of the effect of firepower, the integration of fires with the scheme of maneuver or plan of defense is necessary. Although it is the responsibility of the fire support coordinator (FSCOORD) to insure the correct amount, proper distribution, and coordination of all fires on appropriate targets in the planning and execution phases of the operation, it is the force G3's responsibility to insure that firepower supports the scheme of maneuver or plan of defense.

c. The standing operating procedures (SOP) and the policies of the commander concerned must be considered as soon as a target analysis is initiated. The SOP and the policies of the commander must be well known to all fire support coordination agencies to insure the rapid, efficient engagement of targets.

5-22. Determining Military Importance of a Target

a. The military importance of the target is determined by the threat or potential threat the target presents to the accomplishment of the mission. The military importance attached to a target is valid only at the force level at which the analysis is made. For example, a hostile machinegun analyzed at a maneuver company may be considered a formidable threat to the accomplishment of that company's mission. The same machinegun, analyzed at maneuver battalion, will be considered a much smaller threat to the accomplishment of the battalion's mission. The same weapon, analyzed at division, will probably be considered a relatively insignificant threat to the accomplishment of the division's mission.

b. As a guide in determining priorities for attack of targets, the following four priorities are used:

(1) *Priority I.* Targets immediately capable of preventing the execution of the plan of action are considered priority I targets.

(2) *Priority II.* Targets capable of immediate serious interference with the execution of the plan of action are considered priority II targets.

(3) *Priority III.* Targets capable of ultimate serious interference with the execution of the plan of action are considered priority III targets.

(4) *Priority IV.* Targets capable of limited interference with the execution of the plan of action are considered priority IV targets.

c. All available intelligence concerning a target must be considered in determining its military importance. When additional information becomes available, the target must be reevaluated.

Based on the reevaluation, the priority for attack of the target may be upgraded, downgraded or may be unchanged.

d. A current target list, with an assessment of the current military importance of each target, is an invaluable aid to the fire planner. It insures that the fire planner can readily identify the most important targets and can rapidly plan or initiate fires on them for preparations, counterpreparations, and the various programs of targets. It also serves as a reference document from which to brief the commander in meaningful terms on the total number of targets located, the number of targets that can prevent the execution of the mission of the force, the number that can cause immediate serious interference, etc. This developed artillery intelligence provides vital information to the force for the conduct of current operations and the planning for future operations.

5-23. Determining Precedence of Attack

a. There are rarely sufficient fire support means available to attack simultaneously all the targets that should be engaged. Of necessity, the attack of these targets is spread over a period of time. Frequently, because of such factors as an insufficient amount of ammunition, an insufficient number of delivery units, or both, it may not be possible to attack all the known targets. Therefore, it is often necessary to determine the relative precedence of attack of targets. The artillery intelligence representative or FSCOORD will recommend the precedence.

b. In determining the precedence of attack, consideration should be given to the military importance (priority) of targets (para 5-22). A target assessed as priority I should have precedence over a target of lesser importance.

c. Other important considerations in determining the precedence of attack of one target over another are the characteristics and location of each target and the terrain and weather in the target area.

(1) *Target characteristics.* Target characteristics include, but are not limited to, the—

- (a) Composition.
- (b) Size and shape.
- (c) Vulnerability.
- (d) Mobility.
- (e) Recuperability.

(2) *Location of the target.*

- (a) Proximity to friendly troops.
- (b) Accuracy of target location.

(3) *Terrain and weather.*

(a) *Terrain.* The terrain in the target area has a direct bearing on the vulnerability of the target. Rugged terrain affords considerable natural cover and makes target location difficult. Targets in defilade sometimes can be reached only by high-angle fire or by aircraft. Certain terrain provides complete defilade from some angles of approach but not from others, thereby influencing the selection of a means of attack. Frequently, it may be necessary to move a weapon to a position from which it can deliver effective fire on the target. The nature of the vegetation in the target area should be considered in the selection of ammunition. Information as to ground relief, surface conditions, and vegetation in the target area is desirable in considering nuclear attack. Uneven terrain frequently limits the surveillance of fires. Uneven terrain limits sound ranging coverage, reduces radar coverage, and may reduce the effect of nuclear weapons.

(b) *Weather.* Weather greatly affects the capability of attack by air and, to a lesser degree, by naval gunfire and artillery. Weather is of particular importance in evaluating a target to be attacked with special ammunition. Information as to the current meteorological conditions, visibility at ground level, amount of cloud cover, and height of the ceiling are important requirements.

(c) *Joint effects.* Terrain and weather jointly affect visibility of the target, and further study may be required to determine a suitable means and method of attack.

d. After target priority and precedence of attack are determined, a tentative decision is made as to the type of effect and degree of damage desired. The tentative decision will be confirmed if suitable weapons and ammunition are available.

5-24. Determining the Most Suitable Weapon/Ammunition

a. *General.* The characteristics of available fire support means must be considered to determine which means is most capable of producing the desired effect on the target. A less capable means may be used if time or ammunition limitations preclude the use of a more effective means. FM 6-141-1 is a valuable aid in determining the best weapon system and the amount of ammunition for the engagement of targets.

b. *Firepower.* The fire support means selected must be capable of producing the desired effect on the target and must be able to do so without causing excessive undesirable effects on the target and in the target area.

(1) *Weapons.* The caliber, type, and rate of fire of a weapon must be considered. It is possible that the desired effect may be achieved by one weapon. However, more than one weapon of the same type or of different types may be required.

(2) *Ammunition.* The target may dictate the type of weapon and ammunition to use. The neutralization and harassment of a target can be achieved by fires of lesser intensity than those required for the destruction of a target. The available supply rate or nuclear weapon availability is always considered. The greatest effect possible must be achieved for the amount of ammunition expended.

(3) *Personnel targets.* The attack of personnel in the open by light artillery, light naval weapons, and the fighter bombers is appropriate. Improved conventional munitions and projectiles and fragmentation bombs with variable time fuzes are effective against personnel in the open. Nuclear and toxic chemical fires are the greatest casualty producers, but their employment may be limited to the most profitable targets. Fallout may be used to produce casualties over wide areas.

(4) *Defensive works.* The heavier weapons are best suited to the destruction or neutralization of bunkers, pillboxes, dugouts with heavy overhead cover, and other defensive works. Chemical agents are effective in neutralizing these positions. For penetration capabilities of various weapons, see chapter 27, FM 6-40.

(5) *Materiel targets.* Materiel targets may be rendered ineffective by neutralization of the operating personnel or by destruction of the materiel itself. The problems involved in the destruction of materiel targets are similar to those involved in the destruction of defensive works. Materiel targets are frequently accompanied by personnel and require firepower means consistent with both target requirements. Heavy cannon, antitank and similar missiles, heavy naval weapons, or air bombardment are usually required for the destruction of heavier types of materiel. Properly delivered nuclear fire is effective against all materiel targets. Some chemical weapons may be used to contaminate materiel targets and neutralize operating personnel.

(6) *Large target areas.* Frequently, several targets are located in one large area. Nuclear fires (to include effects from fallout) and toxic chemical fires are particularly effective against a large area the adequate coverage of which is beyond the capability of conventional ammunition or against which the use of conventional ammu-

nitions would require the expenditure of an excessive quantity of ammunition.

c. Troop Safety. The firepower means selected must be capable of engaging the target without adversely affecting friendly troops. The importance of accurate delivery of fire close to friendly lines must be emphasized. Supported troops must have confidence in supporting fire, and this confidence must be carefully fostered.

(1) *Accuracy of the means.* The means selected must be sufficiently accurate to accomplish the desired results. Generally, weapons with large probable errors are not used for close fires. All gunfire and airstrikes in close proximity to friendly troops must be adjusted or given special consideration. Close-in targets for air strikes should be carefully marked; the location of friendly troops should be given to the aircraft and the strike should be controlled by an air controller in the air or on the ground.

(2) *Effects on target areas.* If friendly troops are to move into an area immediately after the delivery of fire, the effect of the fire must not deny movement or safe passage of the troops. Lingering effects from nuclear, or chemical, attack must be considered. Overdestruction of the target may cause excessive debris and create obstacles to passage by infantry and armored elements and thereby actually strengthen the enemy defenses.

(3) *Effects of weather.* The weather conditions in the target area must be considered in relation to troop safety. A wind blowing toward friendly troops may prohibit close nuclear, or chemical attack. Heavily vegetated areas, if flammable, may be ignited by incendiaries, and the resultant grass and timber fires may jeopardize friendly troops.

d. Time Requirements. The time required for the delivery of fire, after the target information is available, depends on the following four primary factors:

(1) The time required to process the information into a specific recommendation or decision as to weapon and ammunition.

(2) The time required to compute data and to secure command approval in situations not covered by directives, guidance, or policies.

(3) The time required to warn troops and aircraft within the radius of weapon effects.

(4) The reaction time of the weapon system. This varies with the weapon system and the state of readiness of the weapons within the system. Nonnuclear field artillery is the most responsive fire support means. The response time of tactical

air depends on the operational status of the aircraft. The air alert status insures greater responsiveness than the ground alert status but is costly. The ground alert status insures maximum use of available air support. The reaction time of nuclear delivery systems varies with the complexity of the system.

5-25. Determining the Method of Attack

When the type and amount of firepower and the means of delivery have been determined, the best method of attack must be determined. The factors which determine the method of attack are discussed in *a* through *d* below.

a. Location of the Mean Point of Impact. In a small target area, the fire is placed on the center of the area. In a large target area, separate mean points of impact (MPI) may be selected to insure adequate coverage. The terrain in the target area is studied, and fire is placed to minimize the protection afforded the enemy by natural cover. The determination of a suitable height of burst is important to the success of a nuclear attack and to some chemical attacks.

b. Surprise Fire. The effectiveness of artillery fire is best exploited by the delivery of fire without adjustment to obtain surprise. Surprise reduces the effectiveness of enemy protective measures and countermeasures. The principal way to obtain surprise is to place a large amount of fire, either nuclear fire or time-on-target (TOT) conventional fire, on an area in a short period of time. The TOT method requires that fires arrive at the target simultaneously from several units; success depends on accurate survey, registration, and the application of meteorological corrections. If the number of units available is not sufficient for effective TOT fires, the use of weapons with high rates of fire is desirable. Surprise chemical fires are used to obtain casualty producing concentrations before the enemy can mask.

c. Density of Fire. In most situations, uniform density of fire on all parts of the target area is desirable. Density of fire is accomplished by using one unit to attack parts of the area successively (e.g., searching or sweeping fire) or by using several units to attack simultaneously. The latter is more effective.

d. Duration of Fire. Although intense fire of short duration is the greater casualty producer, the mission may require fire on a target over a long period of time. The availability of ammunition frequently influences the duration and intensity of the fire, as in harassing and interdic-

tion fire in which the objective is to curtail movement, to disrupt or intermittently deny the use of communication routes to the enemy, and to keep the enemy unnecessarily alerted, all of which impair morale and efficiency. Chemical fires may be employed over a long period of time against targets which have no protection available.

e. Standard Methods of Engagement. See appendix O for the classification of targets and the standard methods of engagement.

5-26. Tactical Damage Assessment

a. Tactical damage assessment is an examination of the target area to appraise the effect of fires. The examination is conducted to determine whether the balance of the tactical plan can be implemented or whether additional nuclear, chemical, or conventional fires are required. The examination of the target area is made by the available surveillance means. Answers to the following questions are required:

- (1) Was the fire accurate?
- (2) Was the enemy in the area of impact?
- (3) Were significant obstacles created?
- (4) Were the desired results achieved?

b. The information for tactical damage assessment can be obtained—

- (1) From target acquisition agencies.
- (2) By imagery interpretation.

(3) By inspection of the target area after capture.

(4) From prisoner of war reports.

(5) From captured documents, reports, diaries, and letters.

(6) From friendly civilian personnel who observed the results of the fires.

(7) By clandestine means.

(8) By communications and electronics intelligence means.

c. Tactical damage assessment is a responsibility of the headquarters ordering the fires and may be made by any agency capable of obtaining the necessary information. The fire support annex may contain instructions for tactical damage assessment.

d. Artillery agencies may make the tactical damage assessment reports and then forward them to the field artillery intelligence representative. All pertinent information is disseminated to higher, lower, and adjacent echelons. Pertinent data from the reports are entered on appropriate file cards. These data are analyzed to determine the comparative effectiveness of artillery weapons, techniques, and ammunition in the attack of specific types of targets. The artillery commander uses information regarding enemy doctrine and practices to increase the effectiveness of artillery fires.

Section VII. FIRE DIRECTION

5-27. General

a. Tactical Fire Direction. Tactical fire direction is the exercise of tactical command of one or more units in the selection of targets, the designation of units to fire, and the allocation of ammunition for each mission.

b. Technical Fire Direction. Technical fire direction is the conversion of calls for fire to appropriate firing data and fire commands to the weapons.

c. Objectives of Fire Direction. The objectives of fire direction are to insure—

- (1) Continuous and accurate artillery fire support under all conditions of weather, visibility, and terrain.
- (2) Sufficient flexibility for prompt and accurate massing of fires.
- (3) Retention of the capability for distribution of fires on numerous targets.
- (4) Control of artillery fire through orders, policies, and priorities.
- (5) Coordination and integration of artil-

lery fires with the fires of other fire support means.

5-28. Artillery Fire Direction Center

a. The fire direction center (FDC), consisting of gunnery, intelligence, and communication personnel and equipment, is the element of the artillery headquarters through which the commander exercises fire direction and fire control. The personnel and equipment to accomplish this function are authorized by tables of organization and equipment (TOE).

b. At division artillery level and above, the fire direction center controls and directs the conventional fires of the units over which it exercises command and control. Firing data are not usually prepared. The S3 or his representative makes the decision to fire, prescribes the method of attack, specifies the amount of ammunition to be fired on each target, and alerts the selected artillery units.

c. The battalion fire direction center translates

target intelligence, fire missions from higher and supported force commanders, and calls for fire into the appropriate fire commands and transmits the commands to the batteries. For special ammunition missions, provisions may be made whereby the division artillery/battalion fire direction center may only monitor the calls for fire which are transmitted directly from the FSCC/FSE to the battery fire direction center. In some units (e.g., Sergeant and Pershing), there is no battalion fire

direction center, as such, since only the batteries have the capability to compute firing data. For the specific duties of FDC personnel, see chapter 18, FM 6-40.

d. Detailed techniques and doctrine of field artillery cannon gunnery are discussed in FM 6-40. Gunnery techniques for missile systems are discussed in the field manuals pertaining to the individual systems.

Section VIII. SMOKE OPERATIONS

5-29. General

Smoke operations vary from an obscuring smoke mission fired on an enemy observation post by an artillery battery to a large-scale smoke operation involving artillery, chemical smoke generator units, Army aviation, and tactical air force units in support of a river crossing or an amphibious assault. A minimal degree of planning is required for a smoke mission on a target of opportunity. Detailed planning is required for multiple smoke missions being scheduled or placed on call.

5-30. Characteristics and Types of Smoke

a. *General.* Smoke is employed in combat to reduce the effectiveness of enemy visual observation. Visual observation is reduced by projecting smoke on enemy observation points, by employing smoke on friendly units and installations, and by projecting smoke between enemy observation points and friendly units or installations. Some types of smoke are used for signaling purposes.

b. *Characteristics of Smoke.* The characteristics of smoke produced by mechanical smoke generators and smoke pots (FM 3-50) are different from the characteristics of smoke produced by bursting-type ammunition. Smoke from white phosphorus (WP) ammunition rises for 2 or 3 seconds after the burst and, under some conditions, may form a mushroom-shaped pillar. This pillar collapses when it cools and may merge with smoke from other bursts to produce a cloud formation. Plasticized white phosphorus (PWP) burns slower than does white phosphorus, and produces smoke with less pillaring.

c. Types of Smoke.

(1) *Screening smoke.* White smoke is generally used as screening smoke, since this color produces the maximum obscuring effect and will reduce the effectiveness of observed or aimed fires. The tactical and logistical situations, including deception plans, will greatly influence the

type of smoke screen (fig. 5-12) to be used. Smoke can be employed to produce a smoke blanket, a smoke haze, a smoke curtain, or obscuring smoke.

(a) *Smoke blanket*—A dense smoke concentration established over a friendly area to prevent enemy visual observation and enemy visual precision bombing. Use of a smoke blanket may restrict movement and activity within the screen, thus hampering operation of friendly troops.

(b) *Smoke haze*—A light smoke concentration established over a friendly area to reduce enemy visual observation during daylight or moonlight. Use of a smoke haze allows movement and activity within the screen, thus allowing near normal operations. Visibility in a smoke haze is normally from 135 to 180 meters.

(c) *Smoke curtain*—A vertical smoke screen established between enemy observation points and friendly units. Smoke curtains are used mainly in the forward edge of the battle area to obscure or restrict enemy ground observation of friendly positions and activities.

(d) *Obscuring smoke*—A smoke concentration placed directly on enemy positions to obscure enemy visual observation into friendly territory. Obscuring smoke is delivered by ground or air means.

(2) *Signaling smoke.* Signaling smoke is available in several colors (red, green, violet, white, and yellow) and can be used to—

(a) Mark enemy or friendly positions by smoke emission on the ground.

(b) Transmit specific messages by prearranged color codes as the example shows below—

1. Red—this position under attack.
2. Green—friendly patrol approaching position.
3. Yellow—lift fires.

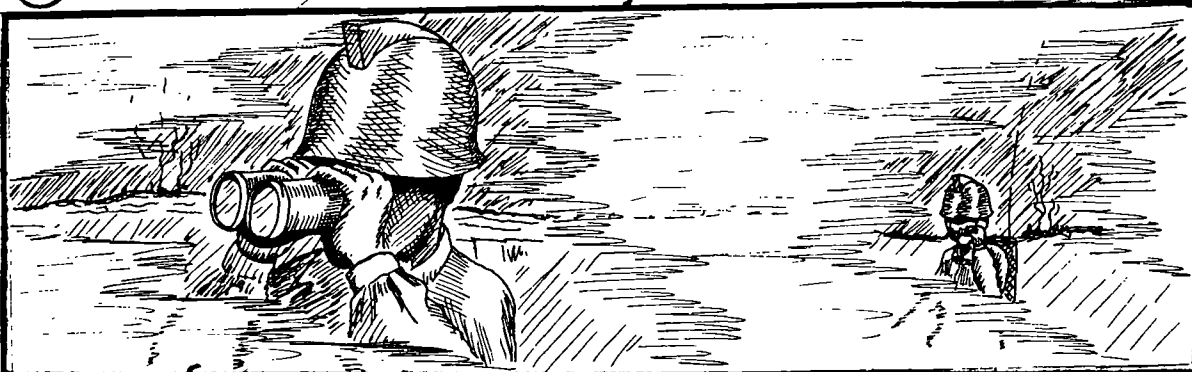
5-31. Command Responsibility

The maneuver commander for whom the smoke

① SMOKE BLANKET prevents enemy aerial visual observation



② SMOKE HAZE reduces enemy visual observation



③ SMOKE CURTAIN prevents enemy ground visual observation



④ OBSCURING SMOKE denies enemy ground visual observation



Figure 5-12. Types of smoke screens.

operation is planned is responsible for the overall operation. He is responsible for the coordination of the smoke operation with all units participating in or affected by the operation. If the effects of a smoke operation transcend a boundary, coordination must be effected with the unit concerned and notification must be given to higher headquarters.

5-32. Staff Responsibility

a. The G3 (S3) is responsible for integrating the smoke operation with the plan of maneuver.

b. The chemical staff officer has primary responsibility for planning smoke blankets, haze, and curtains and for insuring execution of the missions by chemical smoke generator units. He provides technical advice and assistance to the fire support coordinator, the G3 (S3) air, and the Army aviation liaison officer in the airspace control element (ACE) for smoke operations involving artillery, tactical air force, and Army aviation units, respectively. For large-scale smoke operations, he prepares the smoke support annex to the OPORD. Chapter 4, FM 3-50 contains information on equipment and munitions, types of smoke screens, effects of weather and terrain for smoke operations.

c. The FSCoord is responsible for the coordination of all fires on surface targets. He—

(1) Incorporates in the fire support annex appropriate orders and requests for smoke operations involving fire support agencies.

(2) Insures that smoke operations are included in the appropriate support appendixes.

(3) Coordinates all smoke operations by supporting fire support agencies with the chemical staff officer.

d. The G3 (S3) air is responsible for planning and processing smoke operations to be conducted by supporting tactical air force units and for insuring execution of the operations.

e. The Army aviation officer is responsible for planning and processing smoke operations to be conducted by supporting Army aviation units and for insuring execution of the operations.

5-33. Planning Smoke Operations

a. Requests for smoke operations are processed through command or FSE/FSCC channels to the echelon which has approval authority.

b. The requests are analyzed by the various staff elements concerned. If a request involves smoke operations behind the FEBA (Smoke blanket or haze), the chemical staff officer develops

the plan and, after coordination with the other staff elements concerned, submits his recommendations to the G3 (S3). If a request involves operations on or forward of the FEBA, the capabilities of the various organic and supporting smoke-capable units are analyzed by the appropriate staff sections with the technical assistance of the chemical staff officer.

c. The following recommendations are then made to the commander:

(1) Types of smoke missions.

(2) Locations of areas to be screened.

(3) Time to initiate smoke missions.

(4) Duration of smoke missions.

(5) Smoke generator and/or delivery units to be employed.

d. Upon approval of the plan by the commander, the chemical staff officer prepares the smoke support annex to the OPORD. The FSCoord includes appropriate orders and requests for smoke operations in the fire support annex.

e. The G3 (S3) air includes in the air fire support appendix those targets to be smoked by air delivery means.

f. The supporting artillery fire direction center includes in the artillery fire support appendix those targets to be smoked by artillery. Targets or areas to be smoked are included in the target list. Smoke targets to be fired according to a time sequence are assigned to artillery units and are placed in an artillery fire support table. Smoke targets may be included in groups or series of targets. Appropriate instructions for artillery smoke operations are placed in the written portion of the appendix.

g. The center of a smoke target is normally located by grid coordinates to the nearest 10 meters in the target list.

(1) No dimensions are given for pinpoint targets.

(2) The length and attitude are given for linear targets.

(3) The length, width, and attitude are given for rectangular targets.

(4) The radius is given for circular targets.

h. Smoke targets are depicted on the target overlay in the same manner as other targets.

i. The starting time and duration of fire for a planned smoke target are indicated by a horizontal line in the artillery fire support table. Two additional factors are involved in artillery smoke missions which are not involved in the engagement of other planned targets.

(1) Approximately three minutes are re-

quired to adjust fire on the target and under ideal conditions about one minute is required to establish the smoke screen.

(2) Smoke must be adjusted on the target before the smokescreen can be established.

j. The fire planner adds the 1 minute it takes to build a smoke screen to the time length of the horizontal line; e.g., if a commander orders smoke on a target from H-10 to H-5, the horizontal line will extend from H-11 to H-5.

k. The fire direction officer (FDO) will order the forward observer to initiate the adjustment of the smoke on the target in time to complete the adjustment before the time indicated for the establishment of the smoke screen.

l. The fire support coordinator should inform the supported commander of the need for adjusting smoke prior to the establishment of the screen. This factor may influence the commander's decision as to the timing of the smoke screen, since the adjustment may alert the enemy.

m. The amount of ammunition to be fired is not indicated below the horizontal line in the artillery fire support table because the amount of smoke ammunition to be expended will vary with wind direction, wind speed, etc. The type of screen to be established and the type of smoke shell to be employed are indicated in the remarks column of the fire support table.

n. Upon receipt of the smoke support appendix, artillery unit fire direction centers plot the targets, compute the initial firing data, and alert the forward observers who can adjust the smoke. An example of a smoke support appendix is shown in appendix M.

5-34. FO and FDC Procedures for Establish Smoke Screens

Forward observer and fire direction center procedures for establishing smoke screens are prescribed in FM 6-40.

5-35. Determining Smoke Ammunition Requirements

a. *Smoke Ammunition Expenditures.* Expenditures of smoke ammunition vary considerably with each specific mission. Although smoke ammunition expenditure tables (tables 1 and 2) have been prepared for various artillery weapons under a variety of weather and terrain conditions, they are useful as a *guide only*. The amount

of smoke ammunition required to maintain a smoke screen must be determined by observations rather than from the figures in a table. Observers must be trained to adjust a large-scale smoke screen, to alter the screen to fit changing conditions, to keep the screen free of holes and gaps, and to increase or decrease the expenditure of smoke ammunition when necessary.

b. *Use of Tables.* Tables 1 and 2 give the approximate number of rounds per minute required to maintain a smoke screen on a 500-meter front. Under normal conditions, about 3 minutes is required to adjust fire on the target and about 1 minute is required to establish the smoke curtain. The smoke ammunition expenditures in these tables may be considered optimum for the stated conditions. The tables indicate the number of rounds that must impact in the target area. No allowance has been made for extra shells which, because of dispersion characteristics of the weapon, are needed to insure that the required number fall on the target area. Additional ammunition required for this purpose must be considered by the commander of the firing unit, since dispersion varies with each type of weapon and increases with range.

c. *Unit Capabilities.* Unit capabilities to establish and maintain smoke screens vary widely according to the existing meteorological conditions in the target area. The size of an area over which a unit is capable of establishing and maintaining a smoke curtain can be determined by the unit's capability to deliver smoke rounds to the target (rate of fire) and the ammunition requirements for a 500-meter front (tables 1 and 2). For example, a mortar unit of four 4.2-inch mortars can effectively screen an average front of about 600 meters. Under favorable conditions, it can screen three times its average front; under certain unfavorable conditions, it can screen only one-eighth of its average front.

d. *Smoke Capabilities.*

(1) *Smoke curtain.* Volley fire is used to establish a smoke curtain. The first minute will require twice the amount of ammunition that will be necessary to sustain the curtain per subsequent minute.

(2) *Obscuring smoke.* Approximately twice as many rounds of smoke ammunition per minute are required to produce an obscuring smoke effect on a 500-meter front as are required to maintain a smoke curtain.

Table 1. Smoke Ammunition Requirements for 105-mm and 155-mm Howitzers

SMOKE CURTAIN¹

Weapon	Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front			
	Head wind	Tail wind	Flank wind	Quartering wind
105-mm howitzer	22	22	8	17
155-mm howitzer	7	7	3	6

OBSCURING SMOKE EFFECT

Weapon	Number of WP or HC rounds per minute required to maintain an obscuring smoke effect on a 500-meter front			
	Head wind	Tail wind	Flank wind	Quartering wind
105-mm howitzer	50	39	8	33
155-mm howitzer	17	11	3	11

SMOKE CURTAIN USING HC BASE EJECTION SHELL²

Weapon	Maximum meters between points of shell impact (parallel to front)		Rate of fire per point of impact (rounds per minute)		
			Wind speed		
	Head or tail wind	Flank wind	3 knots	9 knots	13 knots
105-mm howitzer	27	360	1.0	1.5	2.0
155-mm howitzer	27	360	0.6	0.9	1.2

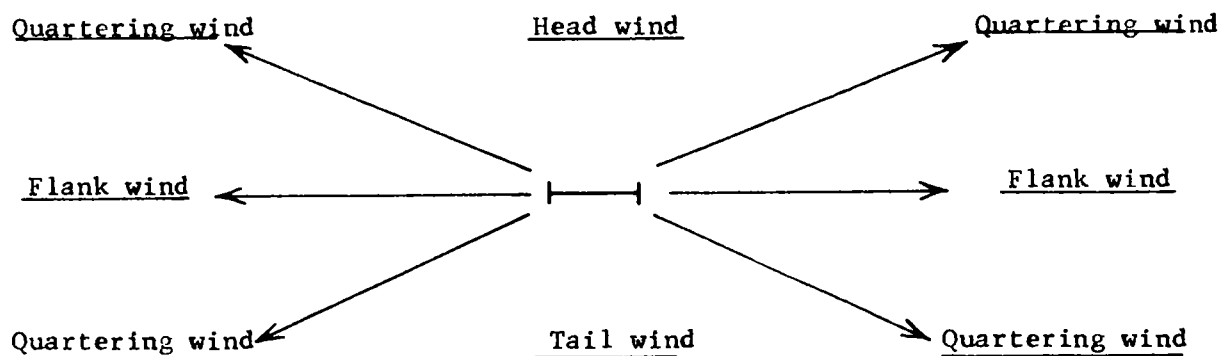
¹ To establish a smoke curtain, employ volley fire, using 2-minute ammunition requirement. Equally space rounds on the front to be screened.² To establish the initial curtain, fire two rounds per point of impact as quickly as possible; to maintain the screen, fire at the rate indicated.Wind direction diagram

Table 2. Smoke Ammunition Requirements for 4.2-inch Mortars

SMOKE CURTAIN								
Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front in flank winds. ^{1 2 3}								
Relative humidity (percent)	Temperature gradient	Wind speed (knots)						
		2	4	9	13	18	22	26
30	Lapse	13	13	11	11	13		
	Neutral	9	9	7	7	9	9	11
	Inversion	6	6	4				
60	Lapse	9	9	7	9	9		
	Neutral	6	6	4	4	6	7	9
	Inversion	3	3	3				
90	Lapse	7	7	6	6	7		
	Neutral	4	4	3	3	4	6	6
	Inversion	3	3	3				

OBSCURING SMOKE EFFECT

The number of rounds per minute required to maintain an obscuring smoke effect on a 500-meter front is obtained by doubling the values for a smoke curtain.

¹ To establish a smoke screen, employ volley fire, using 2-minute ammunition requirement (but not less than 10 rounds). Equally space rounds on the front to be screened.

² For quartering winds, multiply the values in the table by 2; for tail winds, by 2; for head winds, by 2½. Values for head and quartering winds are based on a curtain impact line of 500 meters in advance of the enemy line. Wind directions are with respect to the enemy target or smoke screen. If the curtain impact line is closer than 500 meters, ammunition requirements will be considerably larger. CONTROLLED FIRE BY OBSERVERS IS NECESSARY AT ALL TIMES.

³ Table is for ground impact. For water impact, multiply the values in the table by 1.4.

CHAPTER 6

FIRE SUPPORT COORDINATION

(NATO STANAG 2031, CENTO STANAG 2031, SEATO SEASTAG 2031, NATO STANAG 2047, CENTO STANAG 2047, ABCA QSTAG 110, NATO STANAG 2083, CENTO STANAG 2083, SEATO SEASTAG 2083, NATO STANAG 2099, CENTO STANAG 2099, SEATO STANAG 2099, NATO STANAG 2103, CENTO STANAG 2103, ABCA QSTAG 123, NATO STANAG 2104, CENTO STANAG 2104, ABCA QSTAG 130, NATO STANAG 2111, NATO STANAG 2014, CENTO STANAG 2014, SEATO SEASTAG 2014, ABCA QSTAG 17R, ABCA QSTAG 47.)

Section I. GENERAL

6-1. Introduction

a. The field artillery provides the Army with the expertise necessary to develop the doctrine and plans essential to the successful use of fire support in land combat operations.

b. Combat power in the form of fire support is one of the principal resources available to the commander for influencing the outcome of the battle and is the most responsive and flexible resource. The effectiveness with which he employs this resource in support of his plan of action may be decisive. The coordination of fire support is not a new procedure or technique; the basic principles of fire support coordination have existed for many years. Although the established principles have not changed with the addition of nuclear and toxic chemical weapons, their importance is enhanced by the increased lethality of these weapons.

c. Fire support coordination procedures and the composition of fire support coordination agencies must be flexible. No one system can be equally effective at all echelons at all times. Procedures to accomplish the tasks involved in the coordination of fire support will vary with the headquarters, the amount and type of fire support available, and the type of operation.

d. This chapter provides general guidance for—

(1) Application of the principles of fire support coordination.

(2) Composition of fire support coordination agencies.

(3) Coordination between the fire support coordination agencies and other elements of the supported force.

e. Detailed organization and procedures of fire support coordination agencies should be included in the unit standing operating procedures (SOP).

6-2. Principles of Fire Support Coordination

The successful coordination of fire on surface targets, whether in advance of or in response to an immediate request, demands complete understanding of the basic principles of fire support coordination. These principles are discussed in a through h below.

a. *Employ All Fire Support Available.* Though fire support must not be wasted or employed indiscriminately, the mission must not be jeopardized by excessive economy and caution. An amount of fire support somewhere between the two extremes must be employed to insure maximum economical use of fire support means.

b. *Furnish the Type of Fire Support Requested.* The requesting agency is in the best position to determine immediate fire support requirements. It will already have analyzed the target and applied the principles of fire support coordination. Because of existing conditions (e.g., availability of ammunition, tactical considerations, and safety), it may not be practical to

provide the type of fire support requested. However, the type of fire support specified in the request will serve as a basis for determining the type of fire support to be delivered.

c. Assign Fire Missions to the Agency Capable of Delivering the Most Effective Fire. Fire missions are assigned to or requested of the agency that can deliver the most effective fire, providing that agency can deliver the necessary fire within the required time.

d. Effect Rapid Coordination. Procedures must be established and practiced to effect rapid coordination in order to attack targets within the shortest possible time. Any agency that slows down the delivery of fire on a target may jeopardize the success of the entire force.

e. Use the Lowest Echelon Capable of Furnishing Effective Support. Fire support is furnished by the lowest echelon that has the necessary means available. For example, if division artillery can neutralize a target with organic artillery means, it should do so without reference to higher headquarters.

f. Provide Safeguards to Friendly Troops, Vessels, Aircraft, and Installations. Providing safeguards to friendly troops, vessels, aircraft, and installations is a basic tenet of fire support coordination. Methods of safeguarding friendly elements are discussed in paragraph 6-8.

g. Use a Common System of Target Numbering. A common system of target numbering makes easier the effective use of all fire support means available. For example, if a commander or fire support coordinator (FSCOORD) requests "all available on target number AF1010," all fire support agencies who have the target located will be able to identify the target.

h. Avoid Unnecessary Duplication. Fire support resources should not be wasted by unnecessary "overkilling" of targets.

6-3. Responsibilities of the Fire Support Coordinator

a. The force commander inherently has the final responsibility for all matters relating to fire support. He normally fulfills his responsibilities through his G3, who has the general staff responsibility for integrating fire support with combat operations.

b. A fire support coordinator is designated at each echelon of command from maneuver battalion through field army. The FSCOORD, the senior artillery officer at each echelon, is charged with the specific responsibility for coordinating

all fires on *surface* targets, whether planned targets or targets of opportunity, regardless of the source of these fires. He has the further responsibility for establishing and supervising the operations of the fire support coordination element.

6-4. Fire Support Coordination Agencies

a. General. All available types of fire support are coordinated at each echelon from platoon through field army. Procedures to accomplish the necessary coordination vary with the headquarters, the amount and type of fire support available, and the type of operation. However, any fire support coordination agency is required to—

(1) Provide the commander with coordinated advice and recommendations to insure the most effective employment of available fire support means.

(2) Resolve, to the limits of authority delegated by the commander, the fire support conflicts that arise during the planning and execution of the operation.

(3) Insure prompt and effective attack of targets of opportunity.

b. Levels of Fire Support Coordination. A fire support coordination agency is established at each level of command.

(1) *Company.* The company commander coordinates his own fire support, assisted by the forward observer from the direct support artillery battalion, by the observer from the infantry or armor battalion heavy mortar platoon, and, in some situations, by a forward air controller (FAC) and/or a naval gunfire (NGF) spotter.

(2) *Maneuver battalion.* At battalion level, fire support coordination is accomplished in the fire support coordination center (FSCC) located at the maneuver battalion command post. The degree of formality in the functioning of the FSCC is determined by the maneuver battalion commander. Key personnel normally involved in the operation of the FSCC are as follows:

(a) The FSCOORD, a liaison officer to the maneuver battalion from the artillery battalion in direct support of the brigade.

(b) The infantry or armor heavy mortar platoon commander or his representative.

(c) The S3 air.

(d) A tactical air control party (TACP).

(e) A naval gunfire liaison officer (NGLO), if naval gunfire support is provided.

(f) Representatives of any other available fire support agencies.

(3) *Brigade.* At brigade level, fire support coordination is accomplished in the FSCC located at the brigade command post. An example of a brigade FSCC is shown in figure 6-1. The degree of formality in the functioning of the FSCC is determined by the brigade commander. The commander of the artillery battalion in direct support of the brigade is the FSCOORD. Key personnel normally involved in the operation of the FSCC are as follows:

- (a) The FSCOORD.
- (b) The assistant FSCOORD, the liaison officer to the maneuver brigade from the direct support artillery battalion.
- (c) The brigade S3 air.

(d) An air liaison officer (ALO) from the tactical air control party.

(e) The brigade chemical officer.

(f) A naval gunfire liaison officer, when appropriate, and representatives of other fire support agencies.

(4) *Division and higher levels.* At the division and higher levels of command, a more formal agency is established for fire support coordination purposes. At division, corps, and field army levels this agency is called the fire support element (FSE). The FSE is one of several elements that constitute the tactical operations centers (TOC).

Section II. TACTICAL OPERATIONS CENTERS

6-5. General

a. Definition. A tactical operations center (TOC) is a facility within which are grouped representatives of general and special staff sections concerned with current combat and combat support operations. These representatives assist the commander in executing current operations by providing information of tactical operations and available combat support and combat service support. They make recommendations for command decisions, take action within established policies, and issue implementing instructions.

b. Composition. The exact size and composition of the TOC vary according to the level of command and the combat support and combat service support means available to the command. Each TOC can be established and operated with available equipment. No special equipment or facilities are required.

c. Purpose. The TOC is designed as a fast-reacting, flexible assembly of key personnel expressly concerned with conducting current operations. The purpose of the TOC is to respond instantly to situations which develop during the battle in progress. Instant response is possible because the elements that constitute the TOC are relieved of the burden of routine functions and future planning. The force commander may delegate to key members of the TOC the authority to execute the functions of direction, control, coordination, and integration of current tactical operations and current combat support and combat service support operations. The G3 is normally assigned the primary general staff responsibility for supervision of the tactical operations center. The Deputy Corps Artillery Commander is nor-

mally the Corps Artillery Commander's senior representative in the CTOC.

6-6. Elements Constituting a Typical Tactical Operations Center

a. General. The elements of the TOC are provided by each general and special staff section. Each element is supervised by a chief, who represents the principal staff officer of his respective staff section. The basic rules of staff relationships apply to the tactical operations center. Unity of effort is essential.

(1) Each parent staff section handles all normal routine functions and screens all information to insure that its TOC element is not burdened with unessential details or information.

(2) Appropriate procedures must be established for timely exchange of information between each parent staff section and its TOC element and should be included in the standing operating procedures.

(3) For additional information regarding elements of the TOC, see appendix L, FM 101-5.

b. G2-G3 Operations Elements. The G2-G3 operations elements are the nucleus of the tactical operations center. For ease of operation, the operations elements of the G2 and G3 staff sections must be collocated in the tactical operations center. Figure 6-2 shows how they may be located.

(1) *G2 element.* The G2 element is the focal point for intelligence pertaining to the current situation. Many intelligence missions originate in the G2 element and are passed to the headquarters G2 section for incorporation in the overall G2 collection plan. The intelligence missions may be passed directly to the collection agencies. The

TYPE BRIGADE COMMAND POST SHOWING PLACEMENT OF S2, S3 AND ARTY LO VEHICLES

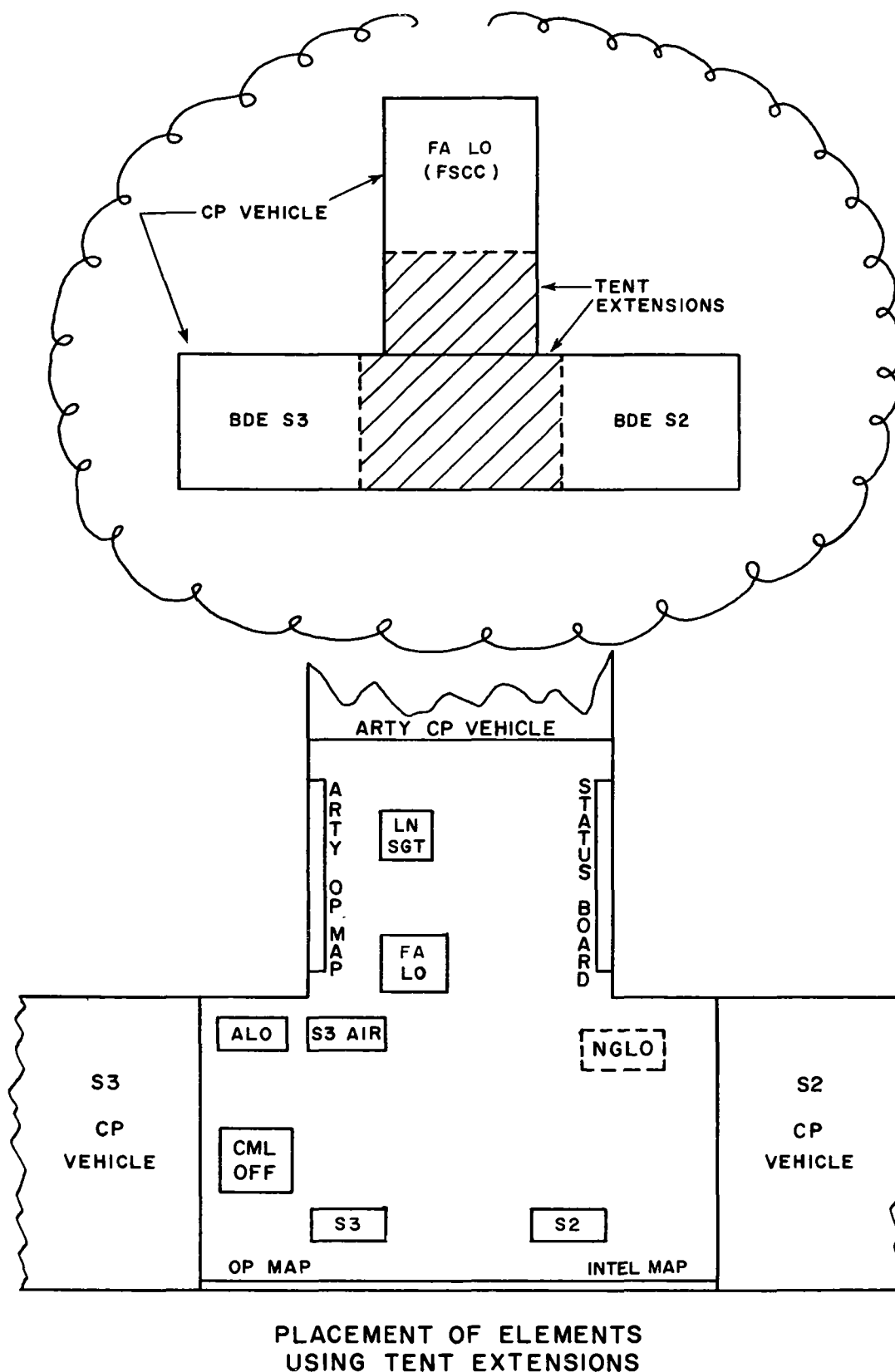


Figure 6-1. Example of a brigade command post showing the fire support coordination center.

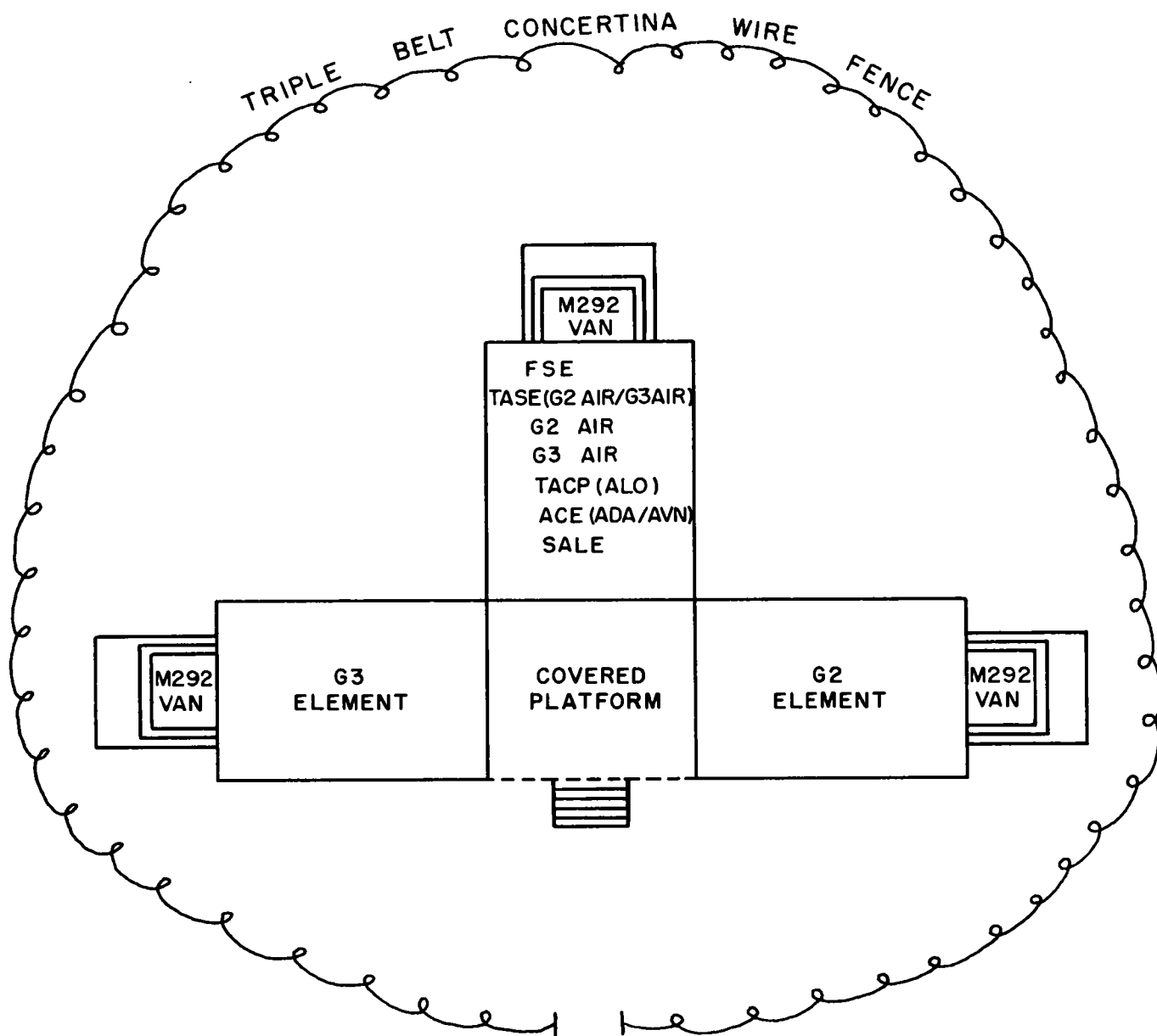


Figure 6-2. Part of a type tactical operations center showing the physical positioning of the G2-G3 elements, the fire support element, and the tactical air support element.

chief of the G2 element is responsible for coordinating the preparation of intelligence annexes, estimates, and summaries for use in current operations.

(2) *G3 element.* The headquarters G3 section provides the G3 element with information required to coordinate tactical operations with combat support and combat service support in the tactical operations center. The chief of the G3 element is responsible for coordinating the prepa-

ration of operation orders and directives. He is responsible for making recommendations to the G3 on the employment of combat and combat support means. His recommendations are prepared in conjunction with the G2 element and are coordinated with other affected TOC elements.

c. *G1-G4 Representation.* A TOC may include representatives from the G1 and G4 sections on an as-required basis. These officers advise TOC elements on personnel and logistical support status and capabilities. Also, they inform the gen-

eral staff officers whom they represent of all significant developments and probable requirements for personnel and logistical support. These representatives, when present, are normally stationed within the G2-G3 elements.

d. Electronic Warfare Element. The electronic warfare element (EWE) coordinates information and furnishes advice on the capabilities and limitations of electronic warfare, evaluates the supported command's intelligence requirements in terms of United States Army Security Agency (USASA) mission capabilities, and serves as the point of entry into the TOC coordination of passive and active USASA information.

e. Airspace Control Element. The primary function of the airspace control element (ACE) is coordination of the use of airspace over the command area. The element serves as a source of information for the current status of air defense and Army aviation capabilities. The FSCOORD coordinates with the ACE concerning field artillery requirements for airspace and the allocation of Army aviation. This element is normally collocated with the fire support element (FSE).

f. Tactical Air Support Element. The tactical air support element (TASE) consists of the G2 air, the G3 air, and representatives of the tactical air force. This element serves as a central facility through which requests for tactical air support are coordinated and integrated with current operations. To facilitate coordination, the TASE is normally collocated with the fire support element, as shown in figure 6-3.

g. Fire Support Element.

(1) The primary function of the fire support element is coordination of all supporting fires on surface targets. An example of a division FSE is shown in figure 6-3. This element serves as a central facility through which the force commander's policies for employing fire support are implemented and within which plans for fire support and calls for fire are processed. Artillery fire planning channels are shown in figure 6-4. Artillery fire request and tactical air request channels for Air Force support are shown in figures 6-5 and 6-12. Naval gunfire request channels are shown in figure 6-13.

(2) Personnel and equipment to man the FSE are authorized in the TOE of the headquarters and headquarters battery, division/corps artillery, and within the artillery section of the Army headquarters company TOE. Key positions in the element are as follows:

(a) Assistant FSCOORD (chief).

(b) Assistant FSCOORD (duty team chief).

(c) Artillery intelligence officer.

(d) Target analyst.

(e) Chemical officer.

(3) The chief of the FSE is the representative of the FSCOORD in the TOC and supervises the operation of the fire support element. He advises other elements of the TOC on the capabilities and employment of all fire support means and insures that the plan of fire support supports the plan of operation. The FSCOORD, through his assistants in the FSE, performs the following functions:

(a) Resolves all fire support coordination problems within the guidance and authority provided by the commander.

(b) Advises the commander and his staff on all fire support matters concerning the most efficient and effective employment and delivery of fires on surface targets, including—

1. Requirements for all fire support means and recommendations concerning their use.

2. Enemy fire support capabilities.

3. Deception operations by fire support means on surface targets.

(c) Maintains information on the status, capability, and limitations of fire support means.

(d) Insures that all fire support is coordinated with tactical operations.

(e) Receives requests for fire support, evaluates the requests in the light of other fire support requirements, and makes decisions to furnish the requested fire support, to substitute some other type of fire support for that requested, or to disapprove the request. He advises the requesting unit of the type of fire support to be furnished and the time it will be delivered.

(f) Recommends the allocation and reallocation of fire support means, including recommendations concerning the available supply rate (ASR) and the organization for combat of all fire support means.

(g) Recommends the employment of ammunition, including nuclear and toxic chemical ammunition, in coordination with the appropriate TOC element.

(h) Recommends the special ammunition load (SAL), which will be based on the amount of nuclear and toxic chemical ammunition that may be expended by the command.

(i) Recommends targets to be attacked with nuclear and toxic chemical weapons.

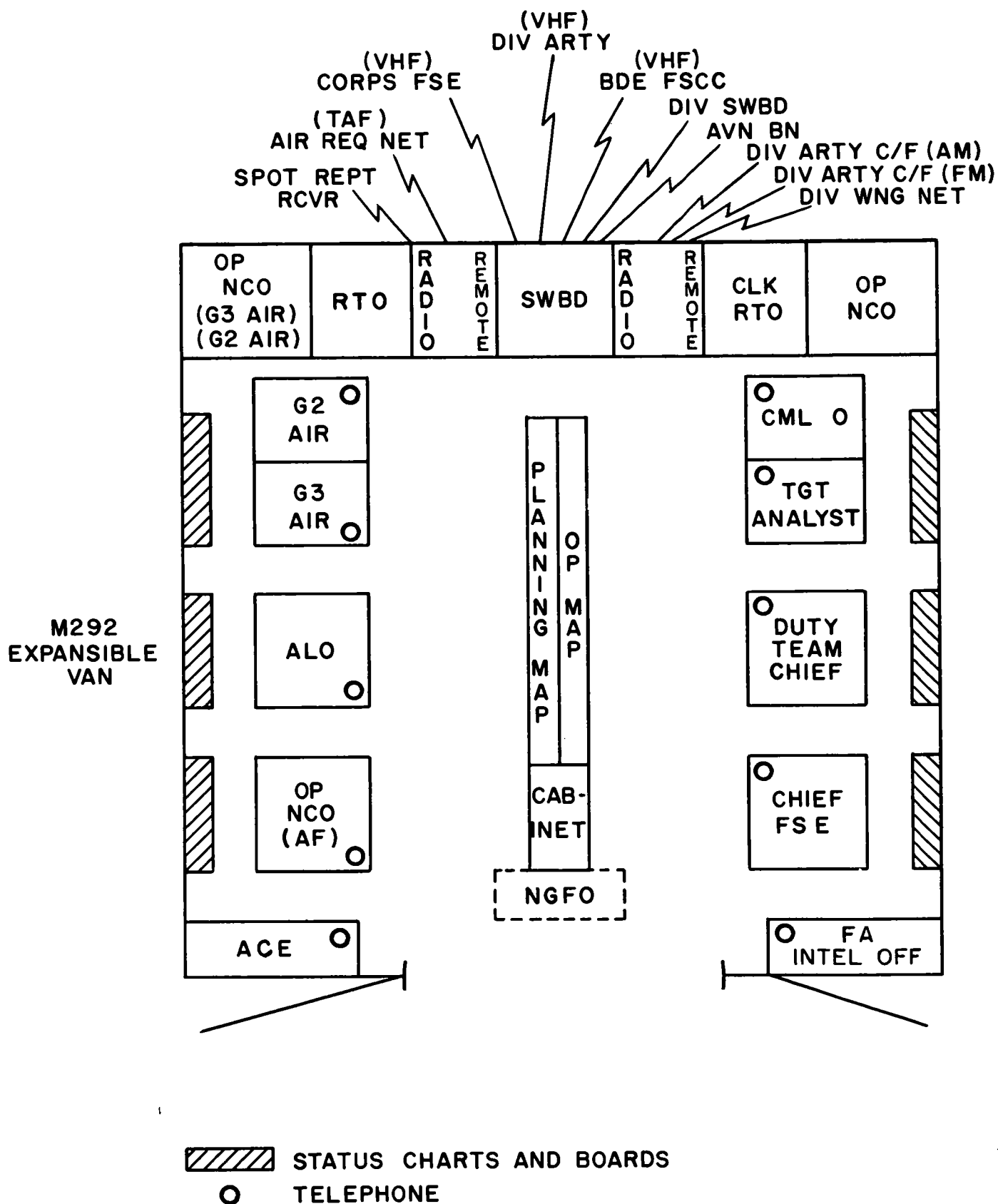


Figure 6-3. Example of collocation of FSE, TASE, and ACE representatives.

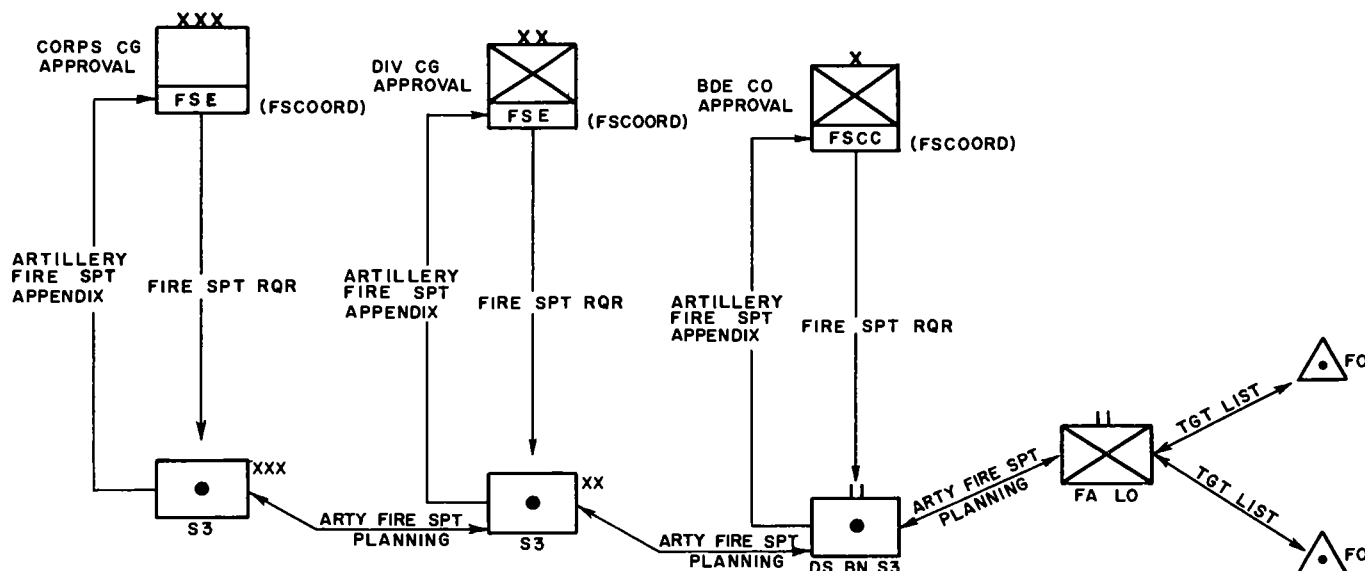


Figure 6-4. Processing channels for artillery fire support appendix.

1. The FSE is normally authorized an artillery intelligence officer to assist the FSCoord in determining the targets to be attacked. The artillery intelligence officer obtains and maintains current information relating to potential targets. His primary duty is to refine target information from barely related facts and suppositions to complete, confirmed target information accurate enough to be used as the basis for recommending the expenditure of some portion of the commander's available weapons. The artillery intelligence officer assembles, collates, and integrates information on potential targets from the mass of target information available in the G2 element and from the artillery S2. Through his knowledge of the requirements for nuclear target analysis and for analysis for employment of toxic chemical weapons, the artillery intelligence officer determines the additional intelligence needed and recommends to the G2 the specific tasks for the collection agencies. The artillery intelligence officer spends much of his time working with the G2 element to determine and define the size, shape, composition, internal disposition, vulnerability, recuperability, and military importance of potential nuclear targets. He is the key link between the G2 element and the artillery S2 and the fire support element.

2. The target analyst in the FSE performs detailed target analysis.

3. The FSCoord is responsible for tactical damage assessment of nuclear and toxic chemical fires employed on surface targets by his

own forces. He maintains a record of the current status of nuclear and toxic chemical weapons and their components.

(j) Initiates and coordinates requests for additional supporting fires and directs the delivery of those fires when they are required.

(k) Prepares the fire support annex, which is the announcement of the commander's decisions concerning the employment of *all* fire support means available. The fire support annex is normally an annex to the force operation order and is the coordinated and integrated plan for the employment of *all* fire support available to the commander. The fire support annex amplifies the fire support portion of the commander's concept of operations by providing specific information and instructions relative to fire support. The annex is a directive to the fire support agencies in the command and a statement of requirements to those agencies not in the command. Planning channels for the exchange of information and instructions relative to the preparation of the fire support annex are shown in figures 6-4, 6-5, and 6-6 and in appendix P.

(l) Recommends current fire support coordination measures.

(m) Coordinates with the air control element on field artillery requirements for airspace.

(n) Maintains the fire support situation map.

(o) Coordinates with the special ammunition logistics element (SALE) the control, distribution, and supply of special ammunition.

Section III. ATTACK OF TARGETS

6-7. General

a. The attack of targets is based on reports by forward observers and other agencies or on requests from the higher headquarters or supported units of the force. More than one means of fire support may be used to attack a target.

b. In selecting the best means of fire support for a particular mission, the supported or force commander and the fire support coordinator consider the—

- (1) Type of support requested.
- (2) Allocation of fire support means.
- (3) Characteristics of the target.
- (4) Desired effect on the target, such as the effect obtained by neutralization, destruction, interdiction, or harassing fires.
- (5) Characteristics, capabilities, and limitations of the weapon and its ammunition; e.g., accuracy, mobility, range and yield.
- (6) Most economical means of delivery.
- (7) Availability of the various types of fire support means and their ammunition supply, planning guidance, authority to expend, and established priorities.
- (8) Relative difficulty of ammunition resupply.
- (9) Speed of execution (response time).
- (10) Problems of weather and terrain.
- (11) Vulnerability of the means to be used.
- (12) Effect of suppression of friendly fires, if required, during an airstrike.
- (13) Communication facilities available.
- (14) Safety of friendly troops.
- (15) Predicted postattack condition of the target area.
- (16) Tactical benefits to be gained.

c. During the planning phase, requests for allocation of fire support are forwarded through normal command channels as are requests for modification or change in the allocation.

6-8. Fire Support Coordinating and Limiting Measures

To facilitate rapid coordination and to insure that safeguards for friendly troops, vessels, aircraft, and installations are provided, the FSCoord employs various coordinating and limiting measures. The most common of those measures are given in *a* through *j* below and are illustrated in figure 6-7.

a. Zone of Fire. An area within which a designated ground unit or fire support ship is responsi-

ble for delivery of fire support. Zones of fire are assigned to artillery and naval gunfire support units for control of fire laterally and in depth. Lateral limits within which a unit must be able to fire may be designated by points or lines. The depth of the zone may be designated by prescribing minimum and maximum range lines.

b. Boundaries. Boundaries are used in both offensive and defensive operations to designate the geographical area for which a particular unit is responsible. Within his own boundaries and unless otherwise restricted, a maneuver unit commander enjoys complete freedom of fire and maneuver. No unit may fire across boundaries unless such fires are coordinated with the unit to whom the area is assigned. The restriction applies to conventional ammunition and to special ammunition and its effects. When fires employed by one force involve troop safety in the zone of an adjacent force, coordination must be effected with the adjacent force.

c. No-Fire Line. The no-fire line (NFL) is established to expedite the attack of targets appearing in another unit's zone of responsibility. It is a line short of which no artillery unit or naval gunfire support ship may fire without prior clearance from the direct support artillery unit that established the line. Only the field artillery unit which established the NFL may fire short of the NFL in its own sector. Coordination is not required for fires beyond the no-fire line. The location of the no-fire line is established by the direct support artillery battalion commander in coordination with the supported unit commander. Each fire support coordination agency and artillery echelon is kept informed of the location of, and changes to, the no-fire line. The division artillery consolidates and distributes this information to the division fire support element (FSE), to subordinate units, to the artillery reinforcing the division artillery, to adjacent division artilleries, and to corps artillery. Corps artillery consolidates information on the division no-fire lines and disseminates it to the corps FSE, to corps artillery units, to division artillery, and to adjacent corps artilleries.

d. Fire Support Coordination Line. The fire support coordination line (FSCL) is a line which takes the place of a bomblines. It is used in relation to air, ground or sea delivered weapons. It should be established by the appropriate land (normally the corps) commander after coordination with appropriate supporting commanders.

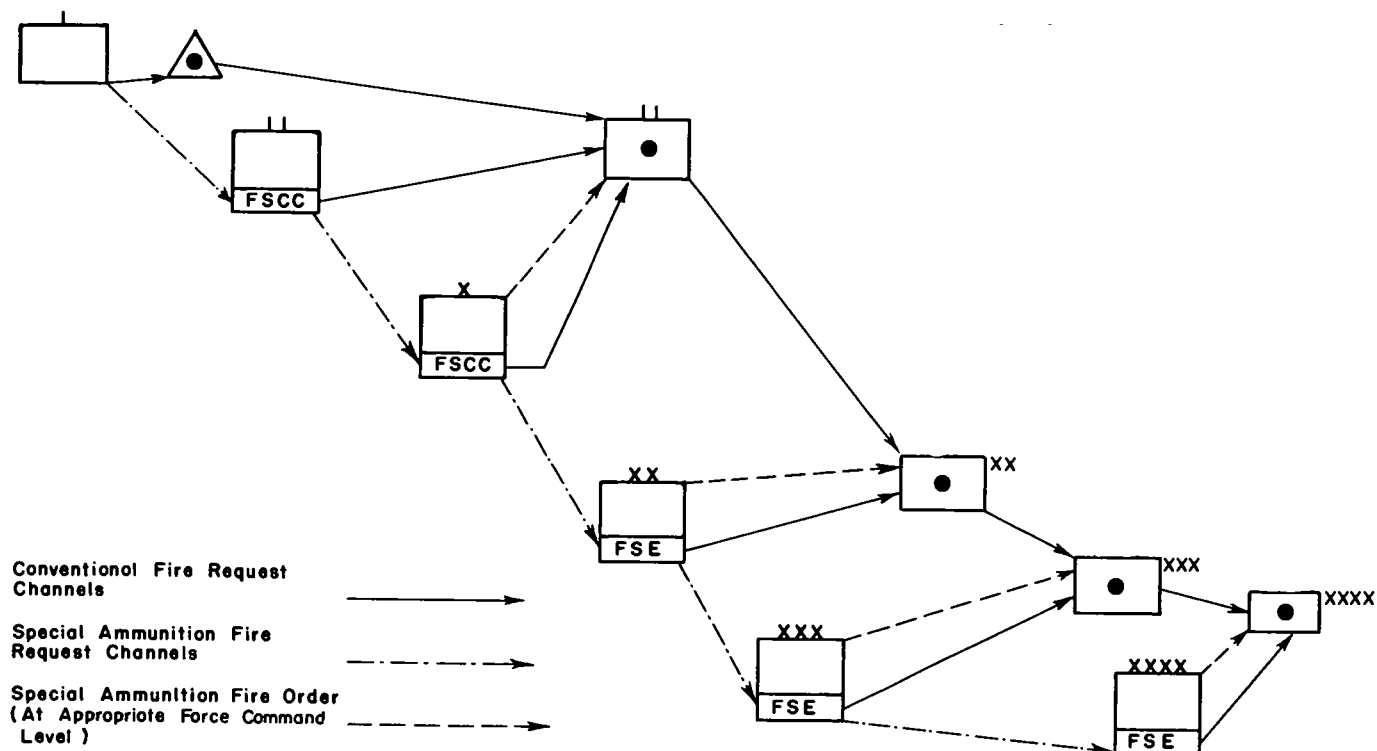


Figure 6-5. Artillery fire request channels.

Where the use of unconventional weapons is intended, this must be specified because of the greater safety distance involved. Behind this line, the attack of targets must be coordinated with the appropriate ground forces commander. It is used to coordinate supporting fire by forces not under the control of the appropriate land force commander which may affect the current tactical operation.

(1) The FSCL should be established a short distance beyond the area into which the corps commander intends to send patrols or penetration forces (including airmobile forces) or in which he intends to maintain covering forces. When detached forces are employed beyond the corps FSCL, another FSCL may be established to encircle the detached forces. When possible, the FSCL should follow well-defined terrain features so that it is easily recognizable from the air. An FSCL is not normally required for units below corps level, since the no-fire lines and the boundaries established by these units provide adequate control measures.

(2) Other units must coordinate with the corps which established the FSCL prior to the employment of fire support against targets within the boundaries of the corps concerned and short

of the FSCL. Coordination must also be effected prior to employment of weapons whose effects (except dazzle and radiological fallout from an accidental surface burst) may fall short of the fire support coordination line. When weapon effects may cross an intercorps boundary and affect friendly forces on both sides of the boundary, coordination must be effected with both of the corps concerned. Requests by a unit that is subordinate to the corps for air support or additional artillery support on a target short of the FSCL and within its own boundary are coordinated and processed through the normal fire support coordination channels. In the case of Air Force-initiated airstrikes short of the FSCL, the Air Force must coordinate with the corps headquarters concerned, through the appropriate Army headquarters or the direct air support center (DASC).

e. Fire Coordination Line. A line established to coordinate fires between helicopterborne or airborne forces and linkup forces or between any converging friendly forces. Fires with effects extending across the line must be cleared with the headquarters of the force on the other side of the line. The FCL is established by the headquarters which controls both forces and should follow eas-

Phases of Processing

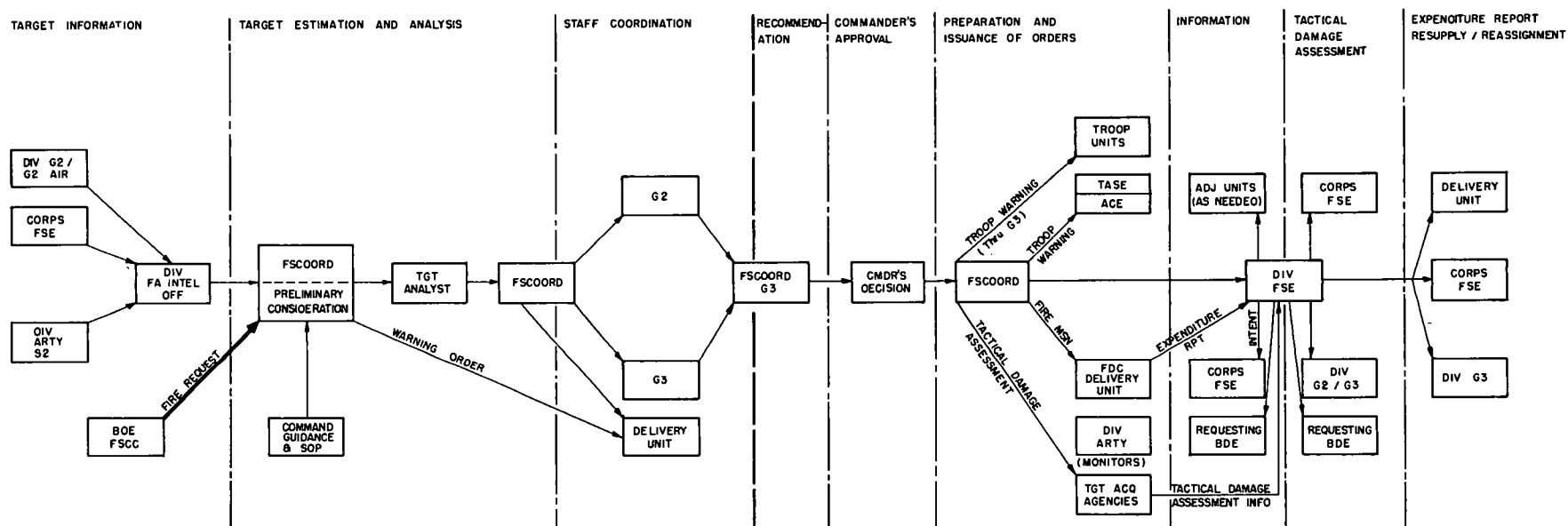


Figure 6-6. Division special ammunition processing phases.

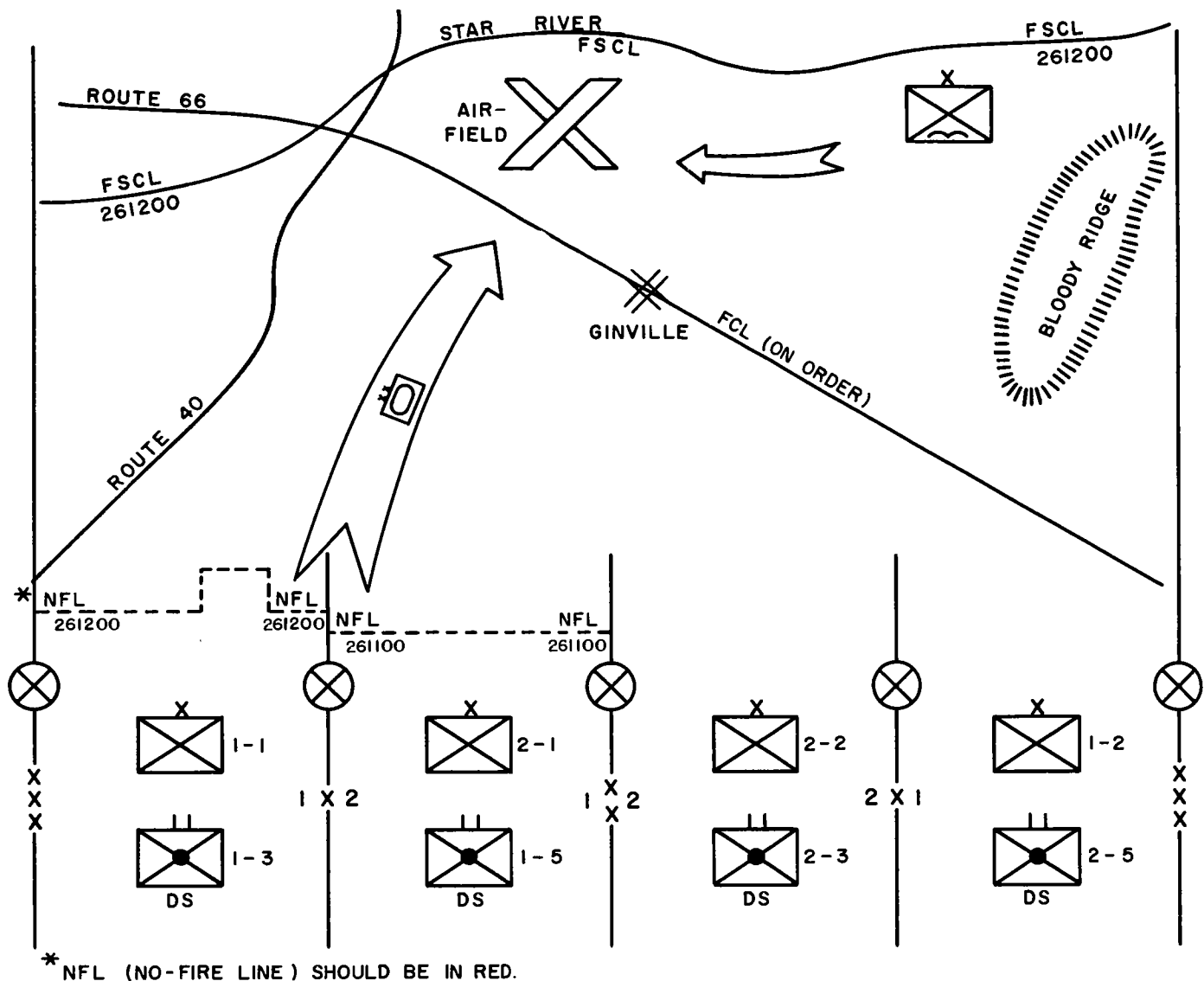


Figure 6-7. Coordinating and limiting measures.

ily identifiable terrain features. It is applicable to conventional and special ammunition.

f. Restrictive Fire Plan. As a safety measure for friendly aircraft on air support missions, a restrictive fire plan (fig. 6-8) may be imposed. A restrictive fire plan establishes a three-dimensional area that is reasonably safe from friendly, surface-delivered non-nuclear fires. Restrictive fire plans should be used only when the risk to friendly aircraft is sufficiently great to justify the attendant loss of surface-delivered fire support. For certain operations, a series of restrictive fire plans may be established, as in helicopter approach and retirement lanes. The fire support coordination center at maneuver battalion prov-

ides a means of coordination that normally precludes the necessity for using restrictive fire plans. Through his FSCOORD, the commander has positive control over or knowledge of surface fire support agencies being employed in his area of operations. Through the tactical air control party, the commander has positive communications with Air Force aircraft. With these means readily available, the commander can impose trajectory limitations or cease surface fire support altogether whenever friendly aircraft may be endangered. Requests for restrictive fire plans are normally approved and disseminated by the division fire support element. The artillery fire direction centers also disseminate restrictive fire plans

and other trajectory limitations to higher, lower, and adjacent artillery fire direction centers to insure receipt. The vital information normally disseminated includes minimum and maximum altitudes, length (by two coordinate points) width (possibly by SOP), and the effective date-time group for commencement and termination. For example: Plan BOZO, altitude 500 feet to 3,000 feet, coordinates 57429392 to 59109545, width 500 meters, effective 281400 to 281410.

g. Free-Fire Area. A free-fire area is a specific, designated area into which any fire support means may deliver fires against known or suspect ground targets without any coordination between the force requesting and/or delivering the fires and the agency that established the free-fire area. The force staff determines the need for a free-fire area, based on the enemy dispositions and current tactical situation, and then recommends to the commander the area to be designated a free-fire area. Although it is preferred that the area be easily identifiable from the air, it may be designated by grid lines. The force commander then requests approval of the recommended area from the host country member (the authority in the area). Upon approval of the request, the designated area is declared clear for firing without further coordination with the host country. Although approving the recommended area, the host country may designate portions of the area as no-fire areas and/or fire coordination areas. Normally, the commencement and termination times of the free-fire area are specified by a date-time group. The force commander then directs that the graphical limits and effective date-time group of the area be disseminated to his subordinate units. On a map or overlay, the area is outlined in black and the words "free-fire area" and the effective date-time group are written inside the circumscribed area (fig. 6-9). The area may also be identified by the designation of the headquarters that established the area; e.g., 2d ALLIED Corps. The units are authorized to fire into this area without further coordination with the force headquarters (commensurate with any coordinating instructions). For example, the free-fire area may be used by tactical air as a target or jettison area, by artillery units for supporting fires, or by attack helicopters and/or aerial field artillery for reconnaissance by fire. The force commander may use the free-fire area method in his tactical area of responsibility (TAOR) and probably will use this method in an area of operations (AO).

h. No-Fire Area.

(1) A no-fire area is a specific, designated restricted area into which no fire support means will deliver fires and into which no effects from their fires will extend. The two exceptions to this rule are as follows:

(a) When the establishing agency requests or approves fires (temporarily) within the no-fire area on a mission basis.

(b) When an enemy force within the no-fire area is engaged with U.S. (Allied) forces and, in the opinion of the commander, is a major threat to the security of the forces and there is not enough time to obtain approval from the establishing agency to fire into the no-fire area. At such a time, the commander will engage the enemy to defend his force.

(2) A typical no-fire area is a no-fire area established by the host country member (the authority in the area) for the protection of a friendly civilian populace from friendly fires within a U.S. (Allied) tactical area of operations or area of responsibility. Upon arrival in the area, the U.S. (Allied) force commander effects liaison and coordinates the locations of no-fire areas with the host country member. The locations, designations, and effective date-time groups of the areas are then transmitted to all units of the force. The established areas should be readily identifiable from the air but may be designated by the use of grid lines. On a map or overlay, a no-fire area (fig. 6-10) is outlined in red and has red diagonal lines drawn through the enclosed area. The words "no-fire area" and the effective date-time group are written inside the circumscribed area. The area may also be identified by the designation of the headquarters that established the area; e.g., 2d Allied Corps. All no-fire areas should be placed on the VCO chart to insure safety in the delivery of fires. No-fire areas may and do change as time passes and the situation changes. The force commander is informed of these changes through constant liaison with the host country member. Identification of no-fire areas and any changes thereto are transmitted in overlay form to the units of the force. During the initial liaison and any subsequent liaison between the U.S. (Allied) force commander and the host country member, it is constantly emphasized that any *specific* target within the no-fire area which is a major threat to U.S. (Allied) forces *can and will* be engaged on order of the force commander.

i. Fire Coordination Area.

(1) A fire coordination area is an area in which specific restraints have been imposed and

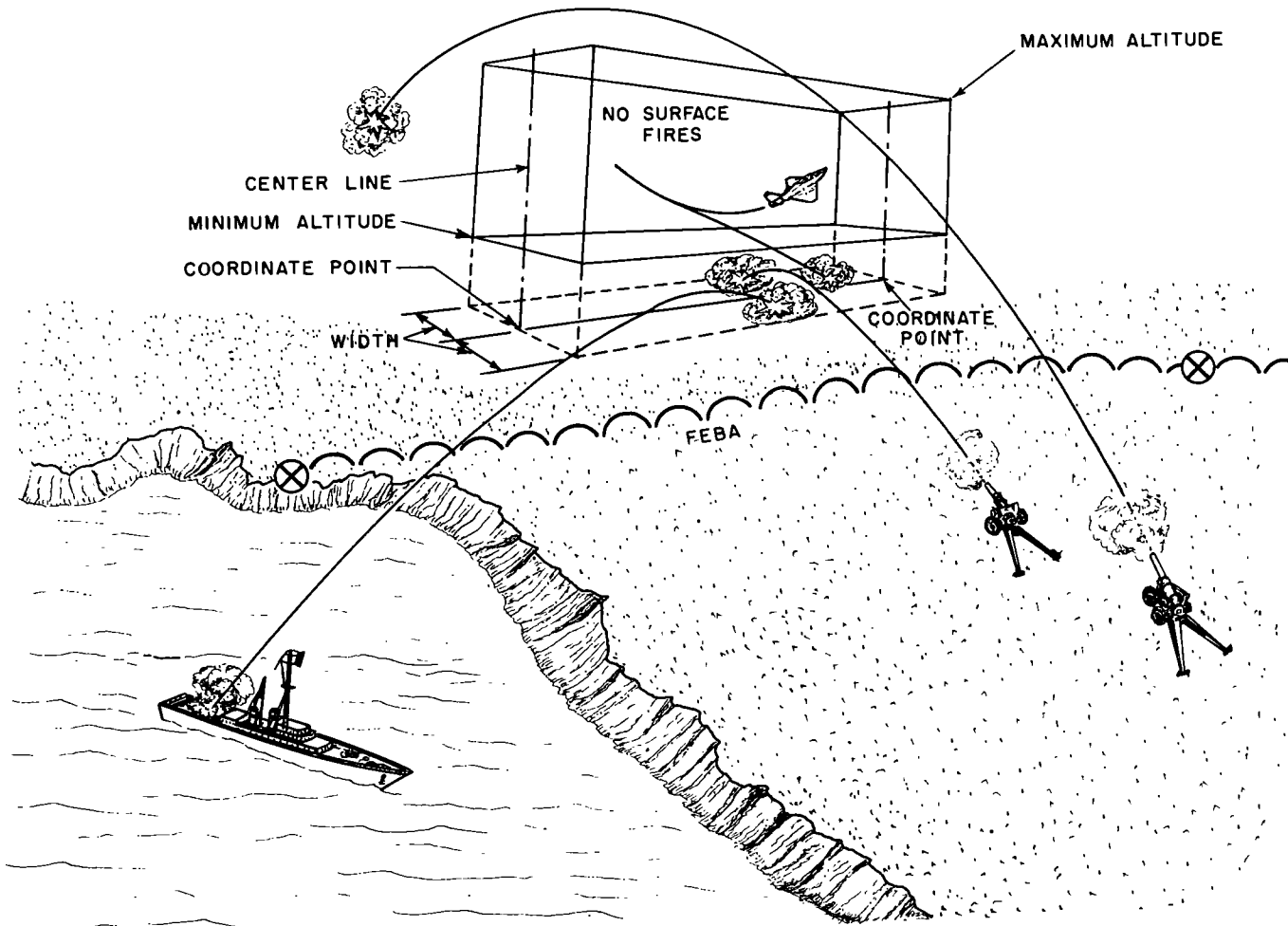


Figure 6-8. Restrictive fire plan.

into which fires in excess of those restraints will not be delivered without approval of the establishing authority. A fire coordination area is established by the maneuver commander to control close defensive fires within an area in which his troops are located. The restrictions on firing into fire coordination areas may vary with locality and time. For example, an infantry commander may impose restrictions such as the following:

(a) The target must be positively identified as hostile.

(b) The target (area) must be observed from the air, the ground, or both.

(c) If the criteria in (a) and (b) above have not been met, permission to fire must be obtained from the authority that established the area.

(2) The fire coordination area is depicted on a map or an overlay (fig. 6-11) by a red line outlining the area. The words "fire coordination

area," the designation of the unit establishing the area, and the effective date-time group for commencement and termination are placed inside the area. No fire delivery means may fire within this area without permission of the establishing authority unless it can meet the criteria in (a) and (b) above. The area should be readily identifiable from the air, but the location can be given as a radius from a point. Preferably, identification of the area is disseminated to all levels in overlay form, but it may be disseminated by radio or wire.

(3) Flight routes and air corridors should be coordinated as necessary.

j. *Nuclear and Toxic Chemical Safety Measures.* Additional coordinating and limiting measures may be required for troop safety when nuclear and toxic chemical weapons are used in support of ground operations. Safety measures should be related to well-defined terrain features

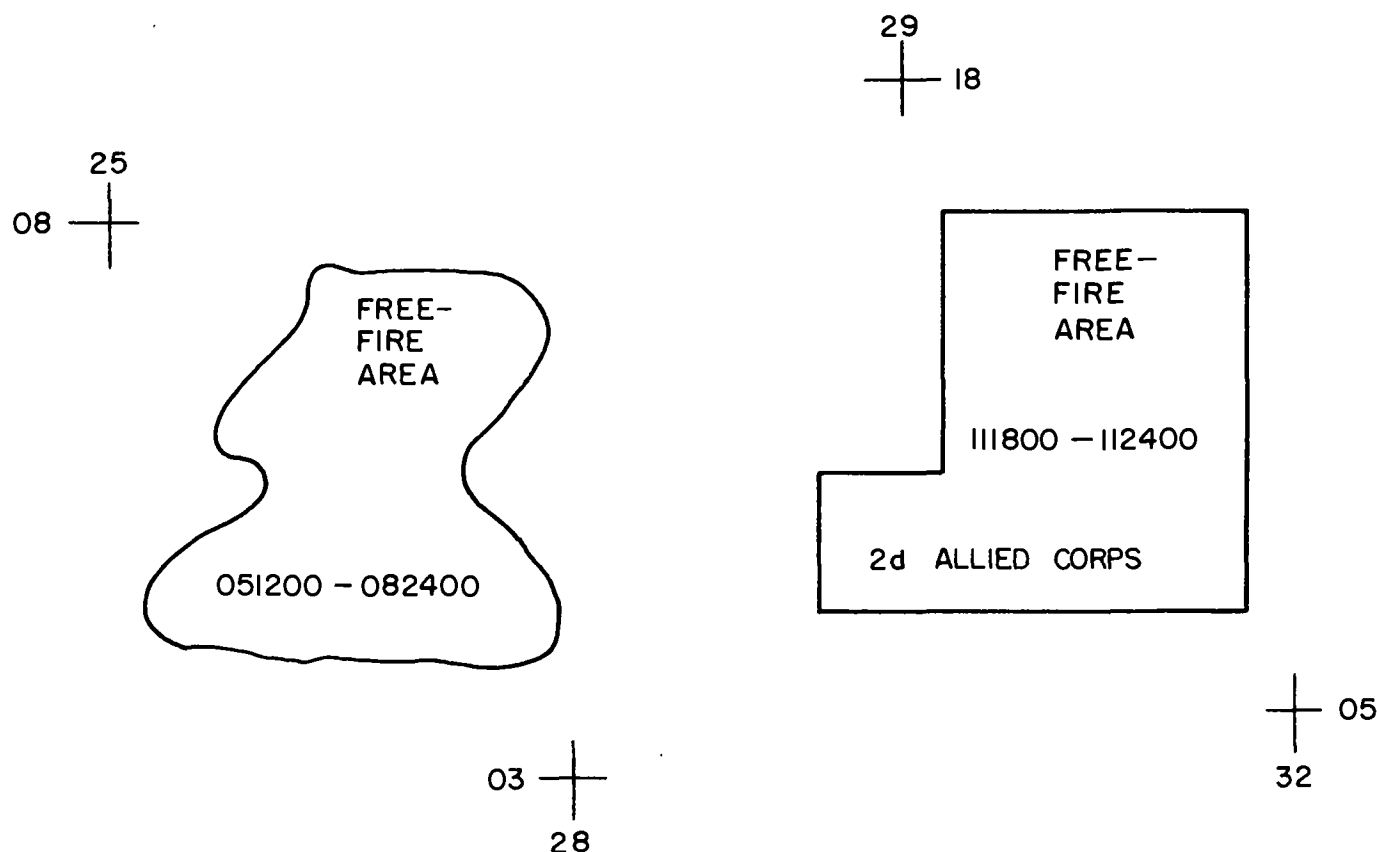


Figure 6-9. Graphical portrayal of free-fire areas.

when possible, based on a careful analysis of the effects of the weapons being used. The FSCOORD is the principal adviser to the commander on establishing safety measures. Typical safety measures are—

(1) Use of lines of departure to coordinate exploitation of the effects of nuclear and chemical fires.

(2) Use of phase lines to define limits of advance or withdrawal required to avoid unacceptable effects from nuclear and chemical fires.

(3) Use of nuclear safety lines to indicate the limits to which nuclear effects may be permitted to extend.

6-9. Close Air Support

a. General.

(1) Close air support is air attacks against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces.

(2) Close air support is employed to neutral-

ize or destroy enemy ground forces which present a direct threat to friendly ground forces. It is used against targets that are beyond the capability of organic fire support weapons or when the added firepower delivered by tactical fighter aircraft is necessary to achieve desired results. Close air support missions are flown at the request of supported ground forces and are one of the most far reaching fire support means available to the combat soldier.

b. *Types of Targets Suitable for Air Attack.* Types of targets suitable for air attack include the following:

(1) *Mobile targets.* Aircraft, which afford direct observation and high speed and which, unlike artillery, have no requirement to adjust fire, are well suited for the attack of mobile targets.

(2) *Targets not precisely located.* An armed aircraft is a combination target acquisition system and weapon system, making it ideally suited for locating and destroying targets that are not precisely located and not directly observable from the ground.

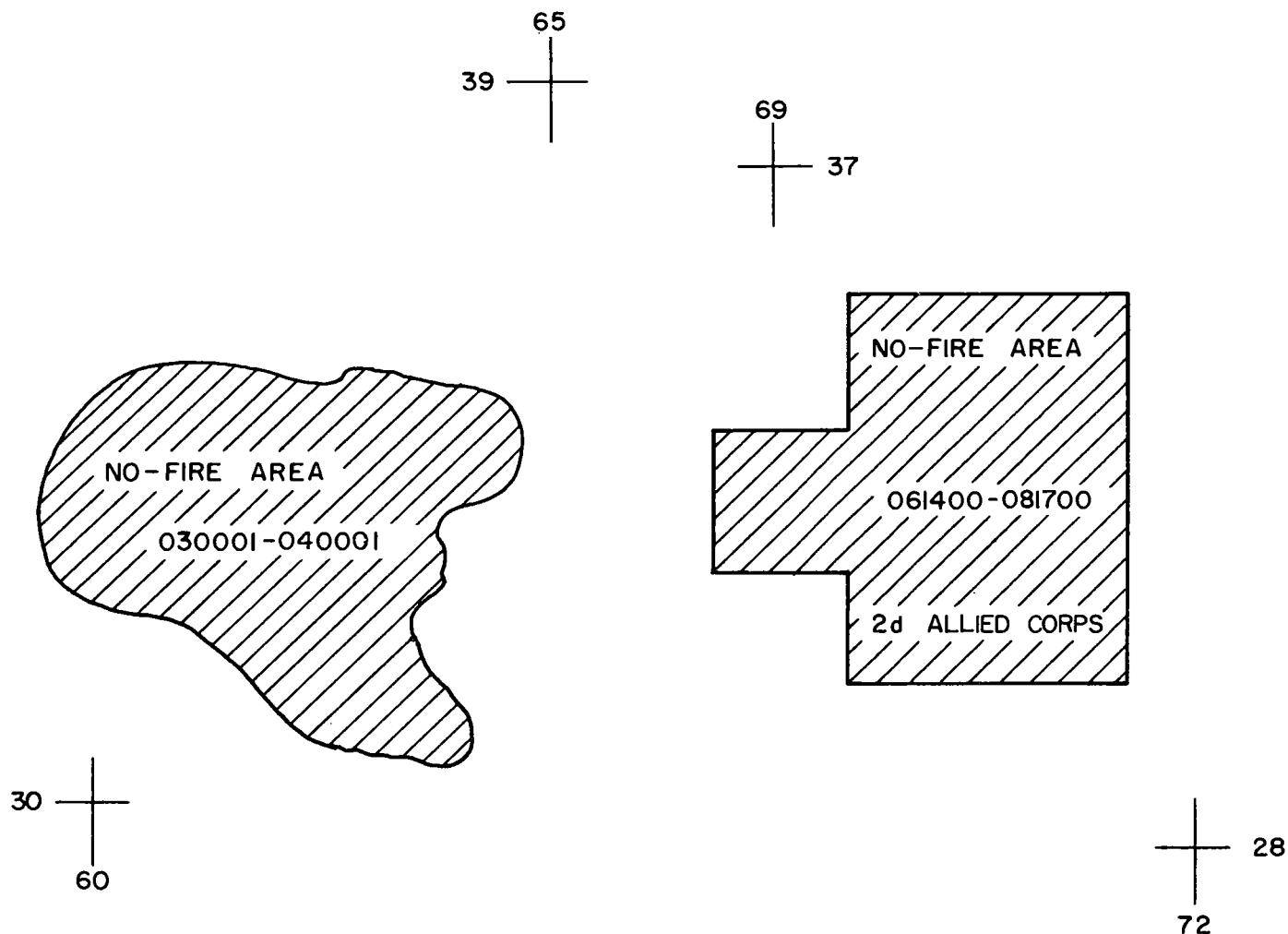


Figure 6-10. Graphical portrayal of no-fire areas.

(3) *Deep targets.* Often, long-range aircraft are the only fire support means that can engage targets deep in the division and/or corps zones of influence or interest.

(4) *Hard targets inappropriate for attack by surface to surface fires.* Aircraft rockets and air-to-surface missiles, with their high penetrating power, can satisfactorily engage hard targets when limited observation, excessive range, or adverse terrain precludes effective delivery of surface to surface fire. Hard targets may include, but are not limited to, bridges, tanks, pillboxes, and other concrete fortifications.

(5) *Unobservable targets requiring confirmed destruction.* The artillery often delivers fire (i.e., counterbattery fire) on a target that is not observable. The target may be within range of field artillery rocket or missile systems but may not meet the criteria for expenditure of rockets or missiles. Tactical air support may be

used to conduct the mission, however, tactical damage assessment is a responsibility of the headquarters ordering the fires. When air support is used, tactical damage assessment must be conducted to determine if the attack was successful or if the target should be attacked again. To expedite operations, armed aircraft can attack the target and immediately report the results.

(6) *Other targets.* Tactical considerations often indicate that tactical air is the best means for attack of a particular target, even though the target normally would be attacked by surface means. For example, aircraft that are on air alert and that still have ordnance aboard at the time they are due off station can employ the ordnance on the target rather than jettison and waste it. As another example, aircraft can neutralize an enemy trench line (normally a good artillery target) by mixing nonfiring passes with several firing runs. The tactical air control party with

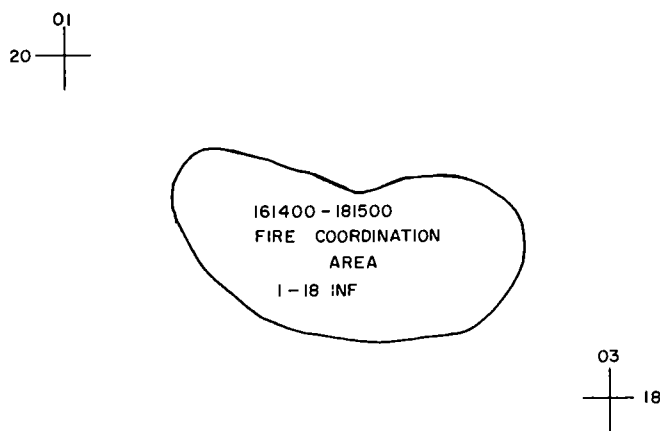


Figure 6-11. Graphical portrayal of fire coordination area.

the assaulting force can coordinate the runs, permitting the assaulting troops to continue to advance while the defender remains pinned down.

c. Categories of Close Air Support.

(1) Preplanned missions are those requested sufficiently in advance of the time of execution to permit completion of detailed plans and briefing of pilots prior to take off. Normally, preplanned missions provide for more effective coordination, more effective matching of ordnance to the target and a more economical use of aircraft and missions than is possible in immediate requests.

(2) *Immediate missions.* Immediate missions are executed in response to requests from supported ground commanders to fulfill urgent requirements that could not be foreseen in advance. Details of the mission may be coordinated while aircraft are airborne. Aircraft allocated for immediate missions are maintained in either an air alert or strip alert status.

d. Originating and Processing Requests for Air Force Close Air Support.

(1) *General.* The Army air ground system for originating and processing requests for close air support is simple yet practical (fig. 6-12).

(2) *Preplanned requests.*

(a) Preplanned requests can be initiated from any army echelon. When originating at the maneuver company level, they are sent to the battalion FSCC over the battalion command net or any other means available. Upon receiving the request at the FSCC, it is reviewed by the battalion S3 Air, FSCoord, and air liaison officer to determine suitability for air attack. If the target can be attacked by organic means, the request for air is disapproved. If the request is approved, the

S3 air adds it to the file of preplanned requests, eliminates duplication, consolidates remaining requests and assigns them in order of priority and precedence. He then forwards the consolidated requests to the S3 air at brigade over the division air request net. The brigade S3 air processes battalion requests in the same manner just described for the battalion level and forwards approved requests to the G3 air at the division Tactical Air Support Element (TASE) over the division air request net. At the division, requests are processed in essentially the same manner as at the brigade and battalion and approved requests are forwarded to the G3 air at the Corps TASE who evaluates the divisions' requests, assigns priorities to approved requests and forwards them as army requirements to the Army Liaison Element at the Air Force Tactical Air Control Center (TACC) (if Corps is the highest Army headquarters). The TACC assigns sorties in accordance with priorities established by the army, cuts fragmentary orders and notifies the Direct Air Support Center (DASC). The DASC then advises the corps TASE. The corps TASE also receives air mission data from army representatives in the TACC. All pertinent information is passed by corps TASE to appropriate subordinate units.

(b) When an operation consists of two or more corps, the Field Army Headquarters and its associated Tactical Operations Center (FATOC) will be established. In this case, preplanned requests will be sent by corps G3 air to the Field Army G3 air, who will make the final consolidation and assign precedence and priority. The Field Army G3 air will send the consolidated list of army requirements to the army liaison element at the TACC. From there processing will proceed as described in subparagraph (a) above.

(3) *Immediate requests.* Immediate requests can also be initiated from any army echelon. Below battalion level they are sent to the battalion FSCC over the battalion command net or any other means available. Each request is validated at the battalion level by the commander or his representative and is then passed to the battalion Tactical Air Control Party (TACP). The TACP transmits the request directly to the DASC over the Air Force air request net. The TACP's at intermediate army echelons monitor the transmissions and acknowledge to the DASC that the request has been received. The DASC passes a copy of the request to the Corps G3 air in the collocated TASE for army action and coordination. Meanwhile the intermediate TACP coordinates

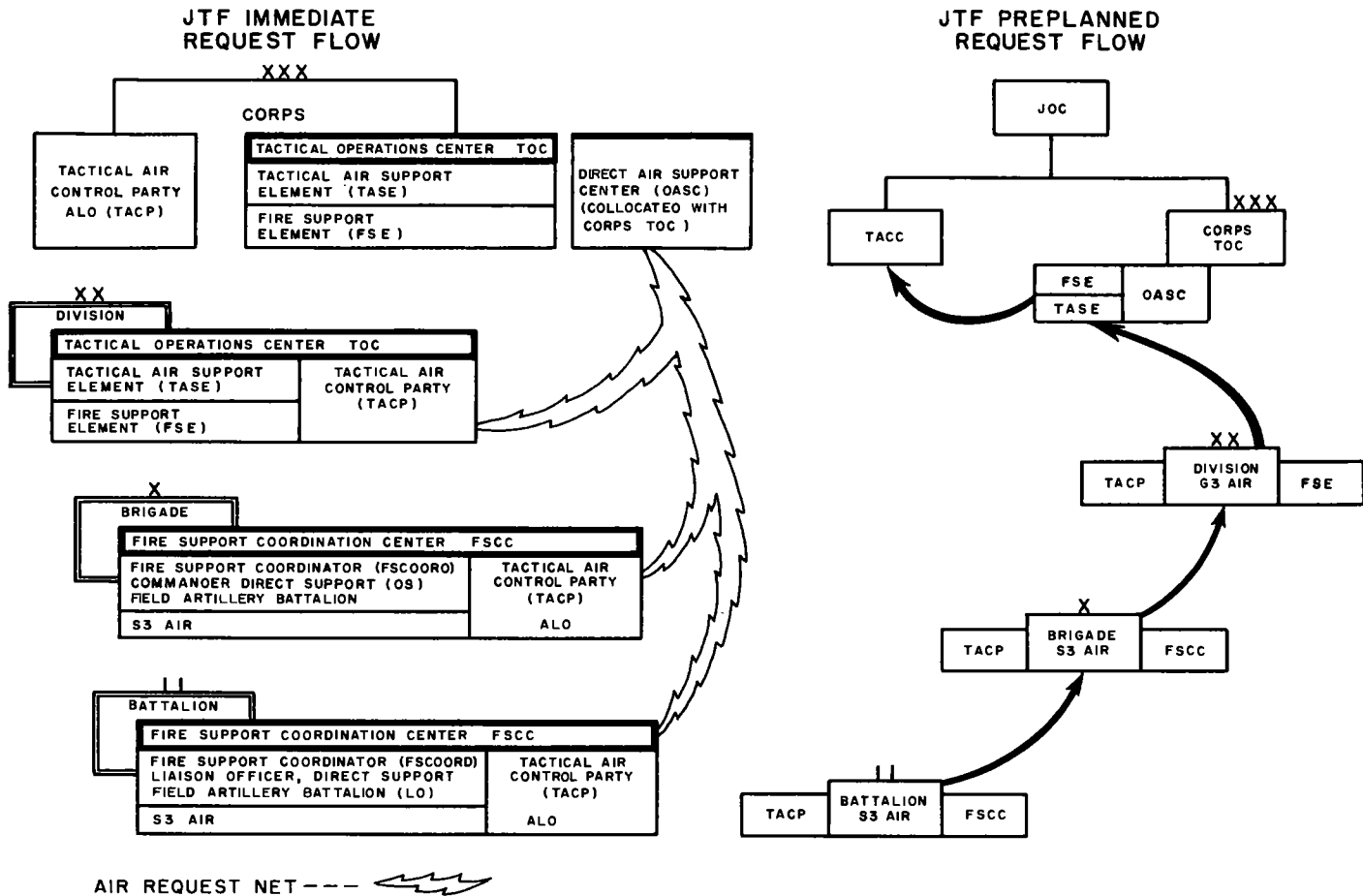


Figure 6-12. Tactical air support request channels for Air Force support.

the request with S3 air/G3 air and FSCoord at their echelons to determine if those levels approve or disapprove the request. Coordination takes place at all echelons simultaneously. If any echelon above the initiating echelon disapproves the request for any reason, the TACP at that echelon notifies the DASC and initiating TACP, giving the reason for disapproval and the request is cancelled. If the disapproval is made at the corps level, the DASC notifies the originator, giving the reason for the disapproval. Normally acknowledgement of requests by intermediate TACP will indicate approval by the associated army echelon unless, within a specified time period, a disapproval is transmitted. Specified time periods for indicating disapproval should be established by standing operating procedures. In certain operational environments it may be desirable that approval be indicated by specific transmission. When positive approval has been directed, intermediate TACP's will transmit approval directly to the DASC. Meanwhile the

DASC accomplishes the planning and coordination required to satisfy the request, pending final approval of the Corps G3 air or subordinate army commands. If the request is approved, the DASC orders the mission flown, utilizing sorties allocated for this purpose.

(4) *Disapproval of air requests.*

(a) Both preplanned and immediate requests can be disapproved at any echelon senior to the requesting echelon. A request may be disapproved for any valid reason. Aircraft may not be available or priority for airstrikes may be to another unit. Aircraft may be unsuited as the method for attack as determined by the FSCoord. The FSCoord may determine that the target can be better attacked by field artillery. However, particularly in the case of immediate requests, the FSCoord who will make the decision, must remember that the requester has filed his request after prudent target analysis and usually after direct target observation and is now waiting for assistance, possibly under adverse

conditions, depending on the nature of the target. The requester expects his request to be honored. If the request for air is disapproved, he rightfully expects the target to be attacked at least by artillery or naval gunfire substituted at some senior headquarters. The FSCOORD must have a valid reason for disapproving a request for air support. For example, in the case of an immediate request, simply because the target is soft and stationary is not reason to deny the air support. Only valid reasons would cause a commander to select air over artillery or mortars for a target. Fire support coordinators must give credit to the preliminary target analysis conducted by the requester.

(b) The FSCOORD will exercise his responsibility to disapprove an air request for appropriate reasons. When a request is disapproved, the disapprover has as much responsibility for insuring that another fire support means attacks the target as he does for invalidating an air request. The target is still a threat and in the case of an immediate request, valuable time has been lost in requesting air support and having it disapproved. With immediate requests, very little time is available to make these decisions, and speed is essential for a successful air ground system. With preplanned requests more time is available for deliberate processing and resolution of questionable areas.

e. Basic Considerations in Processing Close Air Support Missions. Certain basic considerations must be weighed at each echelon before a decision is made to request or approve a close air support mission. Immediate close air support is normally initiated below maneuver battalion level. Planned close air support is normally initiated at maneuver battalion level. In either case, most of the coordination is effected by the maneuver battalion. However, to insure safety and because of his detailed knowledge of the tactical situation, the element leader (or his representative) who is to receive the close air support should have control of that support. Considerations in processing close air support missions are discussed in (1) through (4) below.

(1) *Maneuver battalion.* Normally, targets encountered by a maneuver battalion are attacked by the means immediately available to the battalion, such as its organic firepower, the firepower of subordinate units or supporting artillery, or naval gunfire. With this combat power available to the commander, it must be assumed that some special consideration would influence him to request tactical air support. This decision involves

relating the nature and threat of the target to the nature of the available attack means and relating the effects of delivery of various types of ammunition in the proximity of the force to the scheme of maneuver. There is no standard pattern for considering these relationships, but the fire support coordinator must consider at least these major factors: time, target/weapon characteristics, observation, and terrain restrictions. The factors are discussed in (a) through (d) below.

(a) *Time.* The time factor is considered in three areas.

1. *Response time.* The response time of close air support normally is longer than that of artillery or naval gunfire, since it is tactically more economical to maintain aircraft on ground alert than on air alert. The flying time and the time to load special ordnance, if required, must be considered. Under certain conditions, high-performance aircraft may be maintained on air alert, in which case close air support may be as responsive as or more responsive than ground delivery means.

2. *Target stay time.* Except for fixed fortifications and defensive works, a target acquired by a maneuver battalion (an enemy infantry company, tank column, etc.) seldom remains concentrated and of significant size very long. The stay time of the target must be compared with the response times of the available attack means. If the stay time is too short to use the most effective means of attacking the target, the most responsive means is used.

3. *Maneuver time.* Maneuver time is that period during response time when the following should be taken into consideration: What is happening to the maneuver force, where will it be, and how long a wait can be afforded? Maneuver time must be coordinated with the S3.

(b) *Target/weapon characteristics.* In order to exploit the capabilities of each supporting arm and to avoid unnecessary duplication, the most effective means must be selected for attack of a target. Assuming favorable conditions for the employment of all supporting arms, a thorough knowledge of their lethality, as well as the limitations of air, artillery, and other available fire support means, is essential in weapon selection. The attack system selected and its relation to the safety of the maneuver battalion is dictated by such considerations as the size and nature of the armament employed, closeness to the friendly frontlines, target and frontline identification, and adequacy of control.

(c) *Observation.* Target observation encompasses several aspects to include target location, observation and adjustment of fire on targets, surveillance of known target locations, and postattack damage assessment. The inability of a ground observer to determine the precise location of a critical target or to maintain observation of a moving target during adjustment indicates the desirability of employing close air support. Since the airborne FAC can employ direct observation of the target or target area, he can seek out, pursue, and direct fire on the target and report the results of the attack.

(d) *Terrain restrictions.* The terrain may dictate selection of a weapon not necessarily called for by the target itself. A hard target on a vertical face (forward slope) is ideal for a gun, such as the 175-mm gun or a naval gun, but it is difficult for mortars and light and medium howitzers. The same target on a rear slope is difficult for a gun because of the trajectory limitations, but it could be adequately attacked by heavy mortars or medium and heavy howitzers. In many cases, by maneuvering gunfire support ships, terrain restrictions can be reduced for naval gunfire. Aircraft are more effective because they can usually approach the target from the best direction of attack. However, the aircraft approach as dictated by the terrain may not be the best approach insofar as the safety of the aircraft is concerned. The battalion FSCOORD has specific responsibilities related to the welfare of the aircraft when close air support is selected as the most appropriate means of attack of a target. Restrictive fire plans and counterflak programs must be implemented and the pilot warned of any dangers inherent in the mission. Appropriate warning can be given by the forward air controller (FAC) or may be provided in the initial request.

(2) *Brigade.* At the brigade fire support coordination center the request is monitored and receipt of the transmission is acknowledged. The FSCOORD does not attempt to analyze the target according to the same relating factors as were considered by the requesting battalion. It is not necessary or feasible because the FSCOORD has only the information in the initial air request, which does not portray the target as it is viewed by the requester. The action of the FSCOORD is governed by the brigade situation and any surrounding activities, generally unknown to the requester. The FSCOORD insures that the request is influenced by two major considerations: First, to give the requester what he has requested, when possible, and secondly, to insure

that granting the request is in the best interest of the brigade. The air liaison officer (ALO) advises the FSCOORD on any technical reservations on the safety of the aircraft in flying the mission. If the mission is disapproved, the net will be entered to state disapproval and normally the reason why. A preplanned mission receives the same coordinating considerations as an immediate request and, where possible, is related and combined with other requests.

(a) *The question of economy.* Each request is considered from the commonsense viewpoint. The brigade FSCOORD has no intention of questioning the validity of the commander's *judgment and decision* in requesting air support, but if there is a more economical means available to satisfactorily attack the target in an acceptable time—a means new in the area or unknown to the requester at the time of the initial target analysis—it would be prudent to substitute such means.

(b) *Safety.* Any danger to friendly troops or other supporting arms in flying a mission must be considered. The amount of danger acceptable without some restrictions on the other supporting arms and whether or not any additional warning should be given to the aircraft must be determined at this time. The FSCOORD must be constantly aware of the disposition of friendly troops and of the tactical situation of the brigade.

(c) *Restrictions.* Any restriction for engaging a target must be considered. A restricted target may be restrictive because of its proximity to a target necessary for future operations, or it may be restrictive for humanitarian reasons, such as a hospital.

(3) *Division.* The processing of a mission at division is similar to the processing of a mission at brigade; the same general considerations of economy, safety, and restrictions apply. The FSCOORD considers the request and any subsequent brigade transmissions concerning safety or restrictions. Approval or disapproval of the request will be in accordance with the advice and recommendations of the G3 air, assisted by the air liaison officer (ALO). While the request is being coordinated at each intervening echelon, the G3 air and the ALO at the division tactical air support element (TASE) search for any hostile air defenses that may jeopardize the aircraft during the strike. Counterflak techniques are closely related to counterbattery fires and are often employed in support of close air support aircraft. Because of the detailed and close coordination required, counterflak fires are planned and

coordinated by the fire support coordinator in the FSE/FSCC. The G3 air and the ALO play a very important part in planning these missions.

(4) *Corps*. The DASC receives the immediate request at corps and processes the mission simultaneously with brigade and division. The same factors that are considered at division are considered at corps. At corps, for the first time, the target is matched with aircraft and ordnance. The DASC does not have the authority to fly the mission without the approval of the corps commander as represented by the G3 air or other authorized representative. One copy of the immediate request is passed to the G3 air at the tactical air support element. The G3 air, being familiar with the situation, checks his maps for anticipated action in that area and consults the fire support coordinator. The decision is then made to approve or disapprove the request. If the request is approved, it is presented to the DASC as an Army requirement. When a request is disapproved, the disapprover has the responsibility for insuring that another fire support means attacks the target. Requests for preplanned missions are transmitted to the G3 air rather than to the direct air support center.

6-10. Naval Gunfire Support

a. The landing force organization for control and employment of naval gunfire support includes special staff or liaison representatives from the naval gunfire arm at every level of command from the maneuver battalion, with provisions for a spotter with each maneuver company, to the highest Army echelon present. These personnel are provided from the air naval gunfire liaison company (ANGLICO). The duties of the naval gunfire personnel are essentially the same at all levels, although they vary in extent and complexity. The duties include planning, providing information regarding the availability and capabilities of naval gunfire support, coordinating with other supporting arms, and supervising the execution of naval gunfire support. The naval gunfire liaison officer (NGLO) serves as a member of the FSCC/FSE.

b. At battalion level, the landing force organization includes a shore fire control party (SFCP), consisting of a naval gunfire liaison officer and a naval gunfire spotting team commanded by a naval gunfire spotter (NGF sptr). The shore fire control party is charged with the control and adjustment of naval fires (fig. 6-13).

c. Missions normally assigned to fire support ships are as follows:

(1) *Destroyers*. Direct support of battalion-size units.

(2) *Cruisers and rocket support ships*. General support of brigade or higher echelons.

d. Direct support naval gunfire can be provided as soon as communications are established between assigned direct support ships and shore fire control parties or other observers. A direct support ship delivers both prearranged fires and fires on targets of opportunity. Calls for fire are initiated by the shore fire control party operating with the supported unit. Although members of the shore fire control party are specially trained in the conduct of naval gunfire, simplified procedures permit any supporting arms observer to adjust the fires of a ship. One spotting team is normally available to each committed maneuver battalion to call for and adjust naval gunfire. Requests for direct support fires originating within a maneuver battalion are transmitted directly to the assigned direct support ship. Calls for fire may be transmitted directly to the direct support ship by—

(1) The naval gunfire spotter.

(2) A naval gunfire air observer.

(3) The battalion naval gunfire liaison officer.

(4) The artillery forward observer or artillery air observer if the direct support ship has a radio set capable of entering the artillery fire direction net. If the ship cannot enter the artillery fire direction net, calls for fire may be passed from the forward observer or air observer to the direct support ship via the artillery and naval gunfire liaison officers at the maneuver battalion fire support coordination center. If the forward observer requires fire support in addition to that available from a direct support ship, a request must be submitted to the naval gunfire liaison officer or naval gunfire forward observer at the echelon at which a general support ship is available.

e. General support, as applicable to naval gunfire, refers to those fires delivered in support of the Army force as a whole or in support of an echelon thereof by ships not assigned to the direct support of any specific echelon of the Army force. Requests for general support are usually initiated by maneuver brigades or higher echelons of the Army force. They consist of requests for fire support beyond the capabilities of the ship assigned to direct support. Requests by sub-

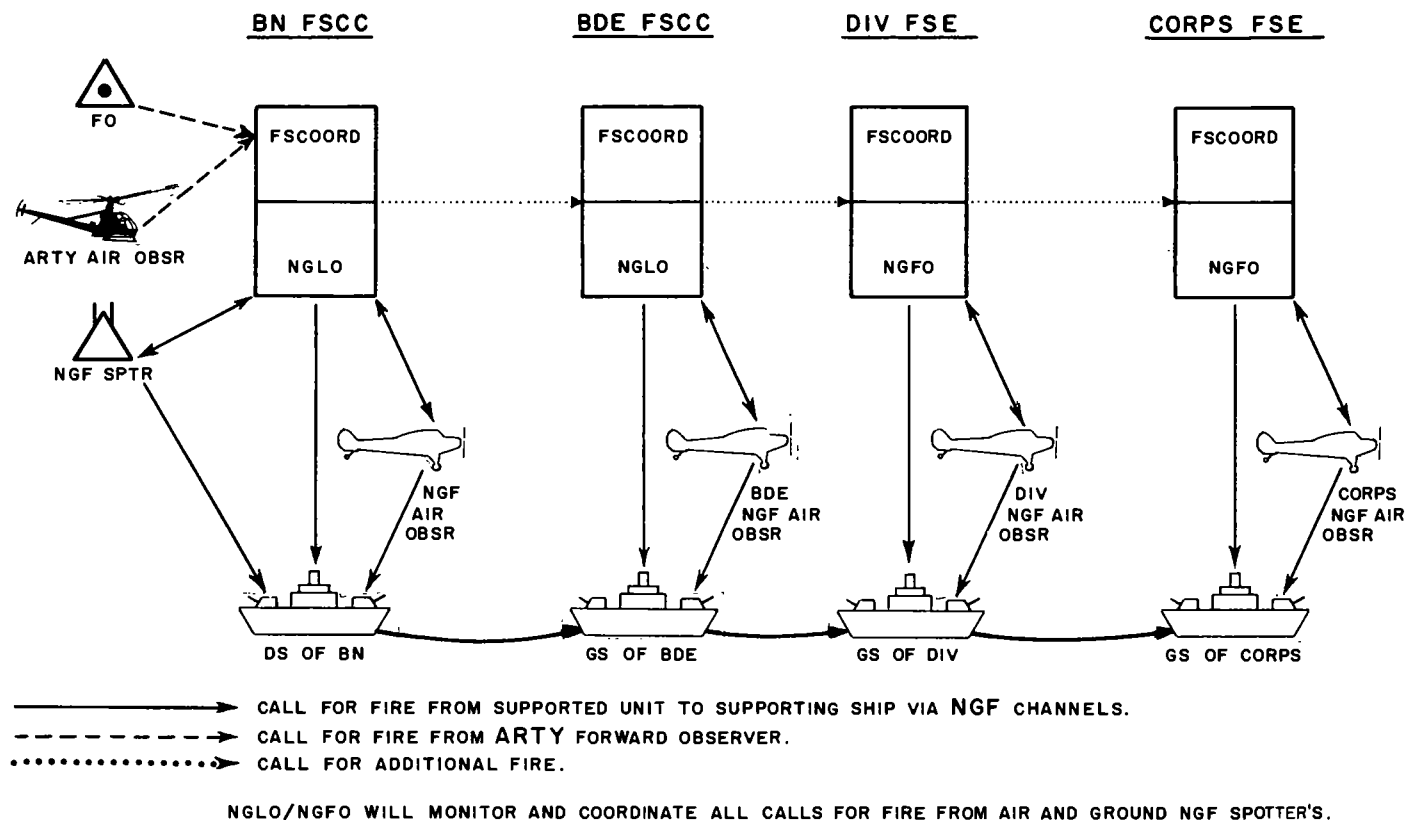


Figure 6-13. Naval gunfire request channels (targets of opportunity).

ordinate Army force echelons for general support are made to each successively higher echelon for fulfillment of the request at the level at which a general support ship is available.

6-11. Army Aviation Fire Support (Exclusive of Aerial Artillery)

Participating Army aviation units may have the capability of employing neutralization fires during their movement and just before landing. Such fires discourage small-arms and automatic weapons fire against the aircraft by forcing enemy personnel to take cover. They do not take the place of other types of fires supporting the operation. Neutralization fires must be carefully coordinated and integrated with all other supporting

fires and with the operations of friendly units in the objective area and along the flight route. Other army aircraft available to the force commander may be employed to provide fire support during the air movement and during the assault and defense of the objective. Attached army aircraft capable of neutralization or area fires may be retained under centralized control or further attached to elements of the force. When the attached aircraft can provide adequate support, the requirement for displacing artillery and other fire support means is reduced. These aircraft also extend the range capability of the combat outpost (COP) forces and provide the commander with timely information relative to long-range enemy activities. Army aviation fire request channels are shown in figure 6-14.

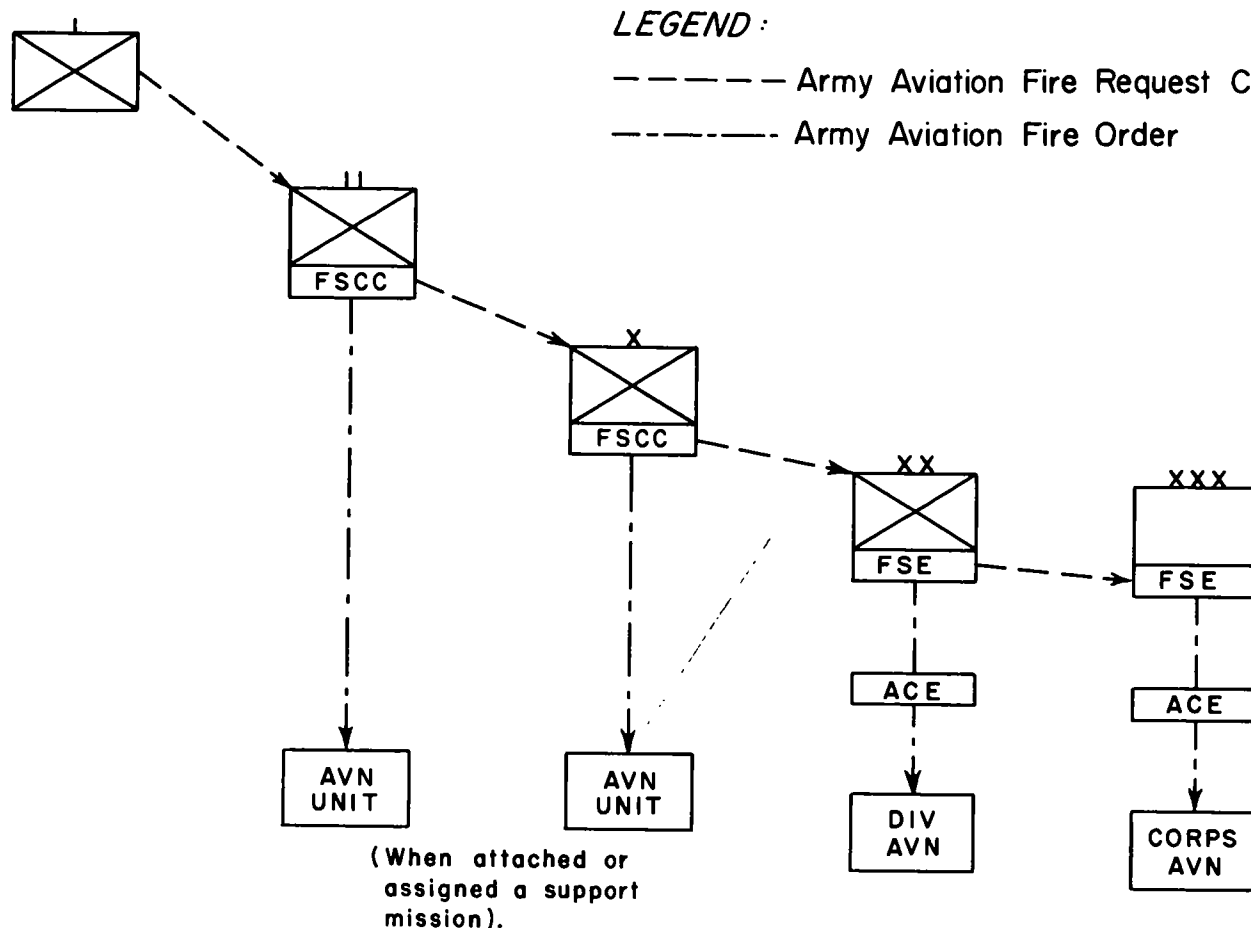


Figure 6-14. Army aviation fire request channels.

Section IV. SPECIAL AMMUNITION

6-12. General

Other elements of fire power that are available to a commander and that have profound influence on operations are nuclear and lethal/incapacitating chemical weapons. These weapons require extraordinary control, handling, and security and include the following:

a. Nuclear and nonnuclear warhead sections, atomic demolition munitions, nuclear projectiles, and associated spotting rounds, propelling charges, and repair parts.

b. Missile bodies (less missiles combining high-density, low-maintenance, and conventional ammunition features), related components of missile bodies (less repair parts), and missile propellants.

c. Lethal/incapacitating chemical agents.

6-13. Commander's Guidance for Employment

The commander's basic guidance for the employment of mass destruction and mass casualty weapons should be included in the unit standing operating procedures. Additional guidance and modifications to the basic guidance, as appropriate, should be announced by the commander at the time that he announces his planning guidance. The commander's guidance for the employment of nuclear and toxic chemical weapons should provide guidance on the—

a. Integration of nuclear, chemical, and nonnuclear fires.

b. Tactical use of fallout.

c. Priority of attack of various types of targets.

d. Authority to expend weapons to include weapons to be retained as a reserve.

6-14. Tactical Control

In joint operations, tactical control of special ammunition is accomplished through allocations and authority to expend. A releasing commander is a commander who has been delegated authority to approve the use of special ammunition within prescribed limits. An executing commander is a commander to whom special ammunition is released for delivery against specific targets or in accordance with approved plans. The term "allocation," as defined in *a* below, is applicable to joint operations as well as to Army operations. In operations involving only Army forces, tactical control of special ammunition is accomplished through allocations and authority to expend weapons.

a. *Allocation.* Allocation is the apportionment of specific numbers and types of complete nuclear and lethal/incapacitating chemical weapons to a commander for a stated time period as a planning factor in the development of combat plans. An allocation permits the subordinate commander to develop plans based on use of these weapons but does not authorize the expenditure of any weapon.

b. *Authority to Expend.* "Authority to expend" is a term used to indicate that a force commander has been authorized to expend a specified number of complete nuclear and toxic chemical weapons. The authority to expend may be granted for a specific period of time, for a phase of an operation, or for the duration of a particular mission.

(1) When an allocation is changed to an authority to expend, the number of weapons authorized for expenditure should be reduced only when absolutely necessary, and notification of any such reduction should be given as early as possible.

(2) A commander may receive authority to expend even though he may not have physical possession of the weapons.

(3) The authority to expend carries no restrictions, such as a requirement for obtaining approval from higher headquarters before each weapon is fired; however, the force operation order or the standing operating procedure may restrict expenditure to specified types of targets.

(4) A commander possessing the authority to expend may further authorize expenditure by units under his control unless instructed otherwise.

(5) In granting subordinate commanders the authority to expend, the higher commander considers the missions of the subordinate units and their capability to effectively employ the weapons.

c. *Special Ammunition Load.* The special ammunition load (SAL) is the specific quantity of nuclear and lethal/incapacitating chemical weapons to be carried by a delivery unit. For security purposes, the commander, after receiving the proper authority, may so position these weapons that a command may have more or fewer rounds in the special ammunition load of its delivery units than have been allocated. Special ammunition, availability permitting, is normally placed in all delivery units to permit dispersal of the ammunition and to permit greater responsiveness after the decision to fire has been made. Special ammunition loads are replenished by direct individual issue, automatic issue, or a combination of the two. When limited amounts of ammunition are available, replenishment is by direct individual issue. When a relatively large amount of a specific type of ammunition is available, replenishment of that particular type normally is by automatic issue. The method of replenishment should be stated in the operation order or standing operating procedures.

6-15. Nuclear and Chemical Fire Support

Progress in the development of nuclear weapons and their associated delivery systems has made powerful weapons available to combat commanders from field army down to brigade level. Continued progress may make them available at even lower levels. Consequently, commanders and staffs at all levels must have an understanding of nuclear weapons and their effects in order to employ them effectively on the battlefield. Certain considerations for the employment of nuclear and chemical weapons are discussed in paragraphs 6-16 through 6-20.

6-16. Preinitiation, Induced Contamination, and Fallout

In considering the distribution of nuclear and chemical fires within the battle area, the commander and his staff are concerned with preinitiation, induced contamination, fallout, and chemical contamination because of the influence these factors have on the scheme of maneuver.

a. *Preinitiation.* The procedures for minimizing the possibility of preinitiation through separation

of nuclear bursts in time and space are contained in FM 101-31-2 and must be incorporated into the planning and scheduling of nuclear fires.

b. Induced Contamination. The area affected by induced contamination is relatively small. Normally, minor adjustments can be made in the tactical plan to avoid exposing troops to induced contamination.

c. Fallout. In comparison with the negligible threat posed by an area of induced contamination, an area contaminated by fallout poses a threat of major military significance. When selecting a height of burst, the commander must weigh the demands of the tactical situation against the hazards of radiation. He may elect to use a surface burst if fallout will contribute to the accomplishment of the mission more effectively than will the effects from an airburst. However, because of the large area covered by fallout, the use of surface bursts is controlled by higher authority.

d. Chemical Contamination. Residual chemical contamination is relatively limited to the target area attacked. The hazard may vary from nuisance effects to varying degrees of casualty producing effects. Troop safety will depend on the protective posture employed by friendly forces. See paragraph 3-11, FM 21-40 for details on mission-oriented protective posture.

6-17. Integration of Maneuver and Fires

Nuclear and chemical fires must be integrated with maneuver to achieve decisive results. The integration of maneuver and fires should be as detailed and specific as time and the situation permit. Effective integration occurs only when a concerted effort is made by the G3/S3 and the FSCOORD during the conception and planning of an operation. To weld maneuver and fires into a single, cohesive entity requires that—

a. The commander's guidance be clear and explicit as to what each component of combat power is expected to accomplish.

b. Appropriate control means be established to provide weapons of appropriate effectiveness to the combat echelon able to control and employ them to the best advantage.

c. Provisions be made to reduce or minimize the risks and limitations to maneuver forces imposed by undesirable obstacles, induced contamination, inadvertent fallout, and chemical contamination. Coordinating and limiting measures should be established *before* the maneuver forces launch their exploitation.

6-18. Basis of Employment

As with any firepower means, the employment of very-low-yield and low-yield nuclear weapons or chemical weapons that will produce negligible chemical contamination is optimized when the weapons are available to the commander who can effectively employ them in accomplishing his mission. The following factors must be considered in determining the level at which nuclear weapons will be employed:

- a.* Target acquisition capability.
- b.* Types of targets and the threat they pose.
- c.* Target stay time.
- d.* Response time.
- e.* Target/weapon compatibility.
- f.* Troop safety.
- g.* Weapon availability.

6-19. Employment at Brigade Level

a. Target Acquisition Capability. Before nuclear fires can be planned, suitable targets must be acquired. An analysis of one example—a typical target array of an aggressor motorized rifle division—showed 80 percent of the targets to be within the brigade area of influence and 20 percent to be beyond the brigade area of influence but within the division area of influence. Of these targets, 30 to 50 percent can normally be acquired in a 24-hour period.

b. Types of Targets and Threat. The types of targets suitable for nuclear attack at brigade level are those targets which present the most distinct threat to the brigade's mission. With the exception of enemy nuclear delivery units, the brigade is primarily concerned with company-size or larger units, since smaller units will not present sufficient threat to the brigade to warrant the expenditure of a nuclear weapon. Chemical weapons are effective against personnel protected from the blast and fragmentation effects of other weapons.

c. Target Stay Time. The stay time of dismounted enemy company- and battalion-size units is short. The stay time of mechanized and armored units is even shorter. Consequently, there is a need for rapid target acquisition and identification, target analysis, and delivery of fire.

d. Response Time. Because of the mobility and short stay time of brigade-type targets, quick response is imperative. The use of appropriate tactical missions and fire request channels reduces response time.

e. Target/Weapon Compatibility. The radii of effects of low-yield and very-low-yield nuclear

weapons or chemical weapons that will produce negligible chemical contamination are such that these weapons are ideally suited for employment against company- and battalion-size units.

f. Troop Safety. The minimum safe distances (MSD) of low-yield nuclear weapons are such that in most cases the only friendly units that will be affected are those units under brigade control or in support of the brigade. The exceptions are the Air Force and Army aviation, which can be warned through communications available to the brigade. When militarily significant chemical weapons effects are estimated to extend beyond the brigade zone or sector, coordination with the adjacent commander is required.

g. Weapon Availability. The number and type of weapons available will determine the echelon at which nuclear weapons will be employed.

6-20. Optimum Procedures

In a fluid operation, time is of the essence in the target acquisition-mission processing-weapon delivery cycle. The nature of the targets and the range and speed of the acquisition and delivery means call for decentralized firing authority and streamlined processing procedures. Figure 6-15 shows the brigade processing phases for nuclear and lethal/incapacitating chemical weapons.

a. Authority to Expend and Special Ammunition Loads. Availability permitting, low-yield and very-low-yield nuclear weapons or chemical weapons producing negligible contamination should be authorized for expenditure at brigade level, particularly when the brigade is making the main effort in the attack or is astride the most vulnerable area in the defense. In mechanized and armored divisions, the special ammunition load of the direct support battalion should contain all the 155-mm nuclear rounds that have been made available to the brigade in order to permit the direct support battalion to respond to brigade calls for fire. In the infantry division, the 155-mm batteries of the general support cannon battalion should be positioned to reinforce the respective direct support battalions by responding to nuclear or chemical calls for fire originating at brigade and relayed through the direct support battalion fire direction center.

b. Analysis, Processing, and Coordination Procedures. Because of time limitations and the absence of details on the composition and precise internal disposition of most targets, target analysis may be conducted by use of the visual method and a precut template. Attention must be given to

troop safety, and a quick determination must be made of the effects of induced contamination, tree blowdown, and fallout (in the event of an inadvertent surface burst or chemical downwind hazard) on maneuver. The analysis is performed in the brigade FSCC by the artillery liaison officer, who is a trained target analyst. When the decision to fire has been made by the brigade commander, the mission is processed through artillery fire control channels to the delivery unit capable of responding. The notification of intent to fire is transmitted to the division tactical operations center through either operational (G3) or fire support coordination communication channels and to adjacent brigades through lateral communication or by relay from the division tactical operations center. Request channels are shown in figures 6-5, 6-16, and 6-17.

c. Warning Procedures. In addition to the notification of intent to fire in *b* above, nuclear strike warning (STRIKWARN) or chemical warning messages must be transmitted to subordinate units. Air Force and Army aviation agencies must be warned so that all friendly aircraft can avoid the overpressures and the flash of light resulting from the burst. These warnings can be transmitted directly from the brigade command post to the Air Force direct air support center (DASC) and to the Army aviation flight operations center (FOC), flight control center (FCC), or airspace control element (ACE) for rebroadcast to airborne aircraft. Troop warning is accomplished through command channels. These procedures do not guarantee that every individual within sight of the burst will be notified; however, they will alert those elements that will be directly affected, including aircraft in the area, in time to permit them to react.

d. Tactical Damage Assessment Requirements. Tactical damage assessment, before the maneuver units are committed, is essential to provide the commander with information that is vital to the operation. The brigade commander must know the actual location of attack, whether the enemy was located in the effects area, the height of burst, the effectiveness of the attack, and whether obstacles were created. This information, which is obtainable by brigade and supporting observation and surveillance means, will permit the commander to launch his exploitation as planned or, if necessary, to modify his maneuver plans. The brigade FSCOORD is responsible for requesting and reporting the tactical damage assessment.

Phases of Processing

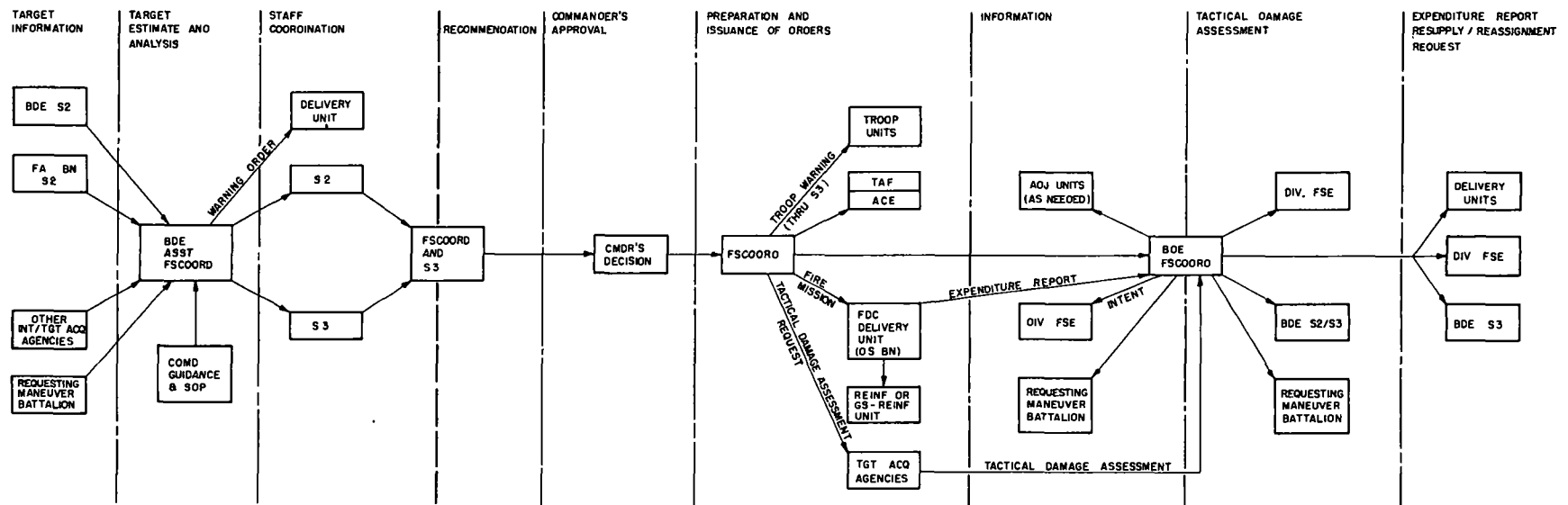
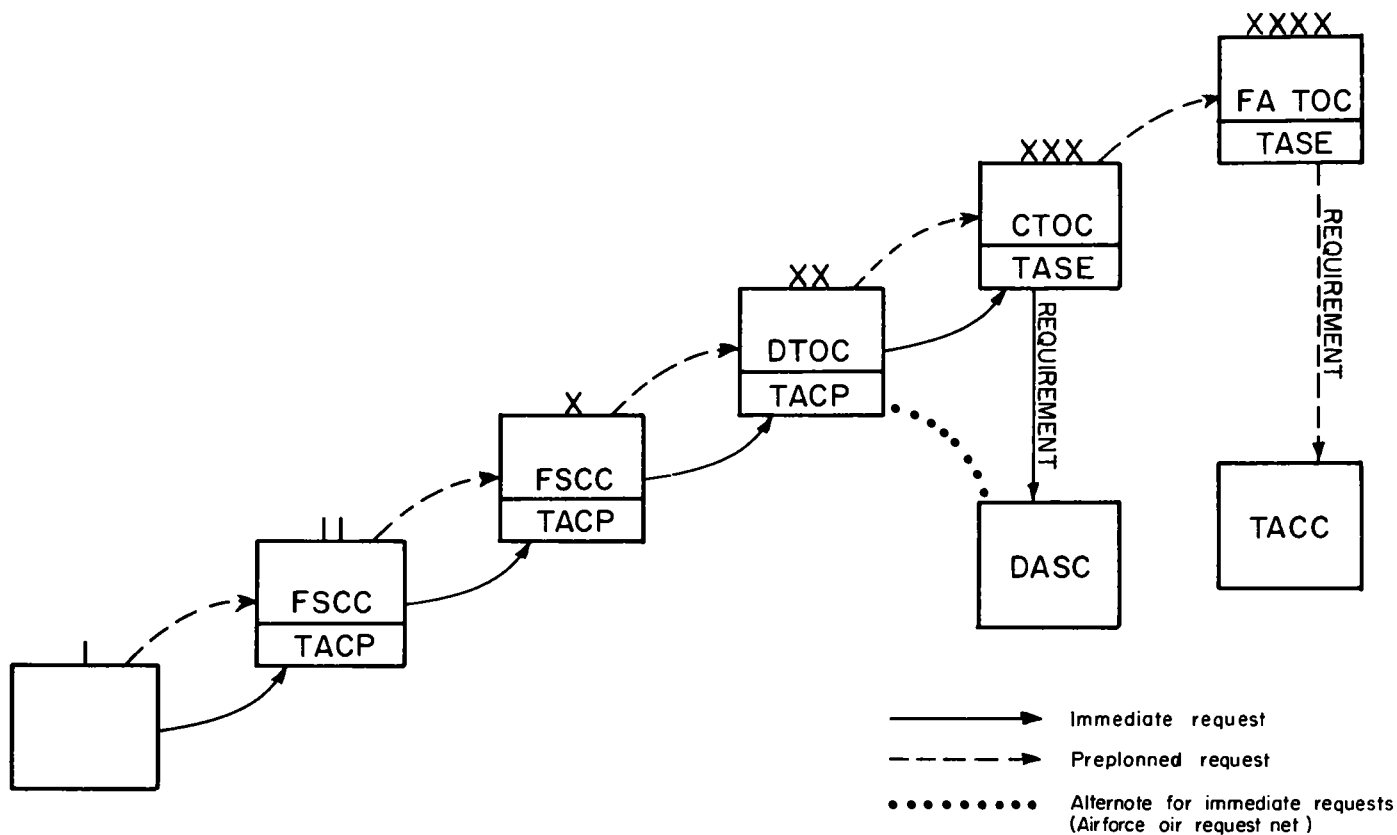


Figure 6-15. Brigade special ammunition processing phases.



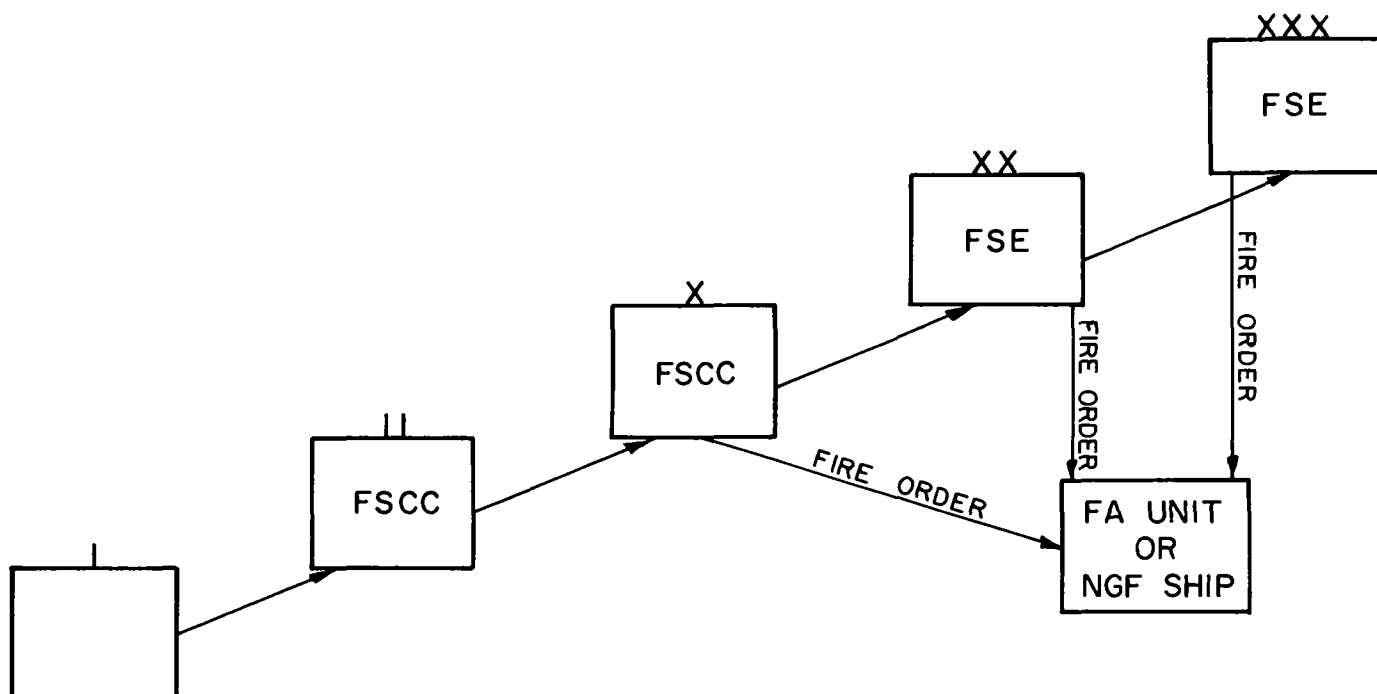
Note: Upon approval of the ground force commander having release authority over appropriate air-delivered weapons, the request becomes an Army requirement.

Figure 6-16. Request channels for Air Force-delivered special ammunition.

6-21. Fire Support Coordination Charts and Records

Examples of fire support coordination charts and

records for conventional and special ammunition are shown in appendix N.



Note: The request stops at the echelon which has authority to expend a weapon that can obtain the desired results. Command approval is required.

Figure 6-17. Request channels for Navy-delivered special ammunition.



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CHAPTER 7

FIELD ARTILLERY IN OPERATIONS UNDER SPECIAL CONDITIONS

Section I. GENERAL

7-1. Definition

Special operations are those operations in which terrain, weather, the nature of the operations, or a combination of these factors creates the need for special techniques, tactics, training, or equipment.

7-2. General

So far as the field artillery is concerned, normal tactics do not change in operations under special conditions, but the techniques of operation *may be modified*. This chapter will discuss the modifications to be considered for certain types of special conditions.

Section II. AMPHIBIOUS OPERATIONS

7-3. General

Most of the standard planning techniques for the employment of field artillery in normal combat operations are applicable to the employment of field artillery in amphibious operations. Differences that do exist apply primarily to the planning, movement to the objective area, and assault phases of the operation. Some of the standard techniques must be slightly modified, and other techniques peculiar to the employment of field artillery in amphibious operations have been adopted. This section emphasizes the techniques and considerations applicable to planning, rehearsal, movement, and landing operations and to subsequent operations ashore. The same techniques and considerations, with minor differences, are also applicable to the employment of field artillery in amphibious raids, demonstrations, and withdrawals.

7-4. Field Artillery Planning

The procedures for planning the employment of field artillery to support amphibious operations are similar to those used for planning normal tactical operations; however, planning for an amphibious operation is characterized by particularly detailed staff work.

a. Initiation of Field Artillery Planning. Upon receipt of initial planning guidance from the landing force commander, field artillery units at all echelons establish the necessary liaison to facilitate planning. Command and staff liaison is es-

tablished with appropriate naval and landing force commands. The objective is to provide the best field artillery organization and delivery means to support the operations envisioned by the commander's concept. This planning is coordinated at every level and is accomplished in sufficient detail to allow subordinate field artillery echelons to conduct concurrent planning. When planning discloses the need for special training, the landing force field artillery officer includes such requirements in his training directives.

b. Field Artillery Planning Tasks. Early in the planning phase the landing force field artillery officer prepares an estimate to determine the capability of the field artillery to support each of the proposed courses of action. Concurrently, the field artillery officer evaluates overall field artillery requirements for the operation. After the landing force commander has announced his decision and concept of operations, the field artillery officer prepares a final estimate of artillery requirements. It becomes the basis for all subsequent field artillery planning. After the scheme of maneuver and the plan of supporting fires are determined, the landing force field artillery officer prepares the plan for the employment of field artillery; the plan, when approved, becomes the field artillery fire support appendix to the fire support annex to the landing force operation order. Subordinate commanders and their staffs concurrently develop estimates and subsequent plans which are based on their own unit's capabilities and requirements.

c. Estimate of Supportability. The estimate of supportability prepared by the landing force field artillery officer (*b* above) is part of the framework for the landing force commander's estimate and decision. The estimate analyzes the comparative capabilities of the field artillery to support each contemplated course of action.

(1) *Influencing factors.* In preparing the estimate, the landing force field artillery officer lists all information and necessary assumptions that pertain to field artillery. He determines the advantages and disadvantages of each course of action by considering the following factors:

- (a) Landing force mission.
- (b) Enemy situation.
- (c) Required artillery support.
- (d) Hydrography.
- (e) Topography.
- (f) Weather.
- (g) Observation requirements.
- (h) Communication requirements.

(2) *Preparation.* Written estimates of supportability are prepared at the field artillery command echelons and at echelons for separate operations or when requested by the supported unit commander. The field artillery viewpoint is reflected in the analysis and comparison of courses of action and in the conclusions made by the field artillery officer in the estimate. The body of the estimate contains five paragraphs.

(a) *Paragraph 1, MISSION.* Paragraph 1 states the landing force mission. It includes two subparagraphs; one states the impact of the mission on the field artillery, and the other contains previous decisions pertinent to the field artillery.

(b) *Paragraph 2, SITUATION AND CONSIDERATIONS.* Paragraph 2 contains four subparagraphs as follows:

- 1. Characteristics of the area of operations.
- 2. Discussion of enemy capabilities.
- 3. Discussion of friendly forces available and friendly courses of action.
- 4. Assumptions pertinent from a field artillery viewpoint.

(c) *Paragraph 3, FIELD ARTILLERY ANALYSIS.* Paragraph 3 contains a discussion, from the field artillery viewpoint, of friendly courses of action. The discussion in paragraph 3 concerns the factors affecting the employment of field artillery with the landing force.

(d) *Paragraph 4, EVALUATION.* Paragraph 4 states the advantages and disadvantages in the employment of field artillery to support each course of action.

(e) *Paragraph 5, CONCLUSIONS.* Paragraph 5 should include the following:

1. A statement as to which course of action under consideration can best be supported from a field artillery point of view.

2. A statement of the disadvantages which render the other courses of action less desirable. These courses of action are normally listed in order to decreasing degree of supportability.

3. A statement of significant problems to be solved and limitations to be taken into account.

4. A statement of measures required to solve the problems involved.

d. Estimate of Field Artillery Requirements. An estimate of field artillery requirements is normally made by the landing force field artillery officer after the landing force commander has announced his decision. The purpose of this estimate is to insure that adequate field artillery support is provided for the operation.

(1) *Determination of requirements.* The estimate establishes the—

(a) Amount of field artillery required by type and caliber.

(b) Amount of ammunition and fuzes required by type.

(c) Number of landing craft and amphibious vehicles required by types.

(d) Amount of special equipment required by type.

(2) *Influencing factors.* When preparing the estimate of field artillery requirements, the landing force field artillery officer analyzes each of the factors listed below in terms of the requirements listed in (1) above.

- (a) Mission of the landing force.
- (b) Scheme of maneuver.
- (c) Enemy situation.
- (d) Characteristics of the area of operations.
- (e) Estimate of the duration of the operation.
- (f) Employment of auxiliary weapons as artillery.
- (g) Employment of other fire support means.
- (h) Employment of nuclear and chemical weapons.

(3) *Preparation.* Written estimates of field artillery requirements are prepared in a form similar to that of the estimate of supportability.

(a) *Paragraph 1, MISSION OF THE LANDING FORCE.*

(b) *Paragraph 2, SCHEME OF MANEUVER.* The scheme of maneuver of each supported unit must be studied to determine the field artillery needed for adequate support. If the landings are to be made over widely separated beaches or landing zones, field artillery requirements may increase, particularly in the long-range types of cannons.

(c) *Paragraph 3, ENEMY SITUATION.* The enemy situation must be considered with the respect to the following:

1. *Nonartillery forces.* Enemy forces other than artillery are considered in respect to numbers and types of units. Their disposition, armament, mobility, amounts and types of equipment, and combat efficiency must be analyzed.

2. *Artillery.* The amount, type, caliber, and range capability of enemy artillery will influence the requirements for weapons, ammunition, and special equipment.

(d) *Paragraph 4, CHARACTERISTICS OF THE AREA OF OPERATIONS.* The following must be considered:

1. Hydrography.
2. Topography.
3. Weather.

(e) *Paragraph 5, ESTIMATED DURATION OF THE OPERATION.* The estimated duration of the operation against the enemy will influence the amount of ammunition required.

(f) *Paragraph 6, EMPLOYMENT OF AUXILIARY WEAPONS.* The number and types of other weapons available and their capability for employment in the artillery role will influence the amount of field artillery required. However, caution must be exercised in reducing field artillery strength since auxiliary weapons have primary missions of their own.

(g) *Paragraph 7, OTHER FIRE SUPPORT MEANS.* Employment of other fire support means are considered with respect to:

1. *Naval gunfire support.* The amount, type, and duration of naval gunfire support available will influence the amount of field artillery required, particularly the heavy calibers.

2. *Close air support.* The amount and type of close air support available must be considered in determining overall artillery requirements.

(h) *Paragraph 8, EMPLOYMENT OF NUCLEAR AND CHEMICAL WEAPONS.* The availability of nuclear and chemical weapons and their potential employment will influence all requirements. The degree to which they influence

the requirements will depend on the commander's concept of operations.

(i) *Paragraph 9, CONCLUSIONS.*

e. *Formulation of the Field Artillery Fire Support Appendix.* The appendix for field artillery fire support is developed after the landing force commander has reached his decision and announced his order or provided the necessary guidance for the field artillery planning to continue. The field artillery appendix is based on the landing force commander's concept of the operation, the final allocation of field artillery units, and the fundamentals of field artillery employment.

(1) *Development of the Appendix.* All of the factors discussed in d(2) above are reevaluated in respect to field artillery units allocated to the landing force. The requirements must also be evaluated in light of the following factors, which influence the capability of field artillery to provide adequate fire support:

- (a) Organization for combat.
- (b) Available shipping, air transport, and helicopter lift.
- (c) Organization for embarkation.
- (d) Target information.
- (e) Counterfire responsibilities.
- (f) Landing beaches and times of landing.
- (g) Position areas.
- (h) Zones of fire.
- (i) Observation.
- (j) Reconnaissance.
- (k) Communications.
- (l) Logistics.

(2) *Preparation of the appendix.* The plan for field artillery fire support with the landing force or principal subordinate elements thereof (division or corps field artillery) is published as an appendix to the fire support annex. It contains the necessary information and instructions pertaining to the employment of field artillery. In an amphibious operation, the field artillery fire support appendix is always complete and is written in detail; however, to avoid unnecessary repetition, references may be made to other annexes/appendixes for certain aspects of field artillery employment. Detailed instructions concerning gunnery are normally contained in the unit SOP. Specific details concerning the operation and instructions that vary from the SOP are included in the appendix.

(3) *Applicability.* The field artillery fire support appendix is applicable to all field artillery under the control of the landing force. Missions are usually assigned only to those field ar-

tillery units retained under direct control of the field artillery headquarters of the command issuing the order. Nevertheless, specific instructions may be included for field artillery units attached to subordinate elements to insure continuity and overall effectiveness of field artillery support. For example, the field artillery fire support appendix to the fire support annex to the division operation order may prescribe that a direct support battalion attached to a brigade landing team be prepared to deliver counterbattery fires on order of the division artillery commander.

(4) *Form and content.* The field artillery fire support appendix is prepared in the standard five-paragraph form as prescribed for operation orders. Reference is made to the standing operating procedures where possible.

(a) Paragraph 1 contains information of the enemy and friendly situation as may be essential for amplifying the field artillery situation. It also shows attachments and detachments of field artillery units.

(b) Paragraph 2 contains a concise statement of the tasks to be accomplished by the field artillery. It is written in the form of a mission.

(c) Paragraph 3 prescribes how the field artillery will support the scheme of maneuver. Subparagraph 3a describes how the commander intends to employ his field artillery to accomplish the mission. Beginning with subparagraph 3b, additional subparagraphs in the number required set forth the organization for combat, tactical missions, landing instructions, position areas, zones of fire, and other pertinent instructions for each element of the field artillery task organization. The last lettered subparagraph is titled "coordinating instructions" and contains information on field artillery matters applicable to two or more units. Such matters include the date and time of landing, gunnery instructions, survey, meteorology, air observation, position areas, fire capabilities, counterbattery, restrictions on fire, and antimechanized fires. Reference is normally made to the standing operating procedure.

(d) Paragraph 4 may contain the plan for ammunition resupply and the available supply rate. Reference is normally made to the administrative plan and to administrative and logistic SOP's.

(e) Paragraph 5 references the signal annex to the operation order, the SOI, and signal SOP. The location of the command posts, both ashore and afloat, are also shown in paragraph 5.

(5) *Tabs and inclosures.* Information that is too voluminous to put into the body of the field

artillery fire support appendix may be placed in tabs and inclosures to the appendix. The task organization, concept, position area overlays, survey plan, list of registration points, assignment of target numbers, and other lengthy documents may be published as tabs or inclosures. Whenever possible, reference is made to the existing SOP.

7-5. Fire Support Planning and Coordination

a. *General.* An amphibious operation is inherently naval in character; therefore, a naval officer, the joint amphibious task force commander (CJATF), is responsible for the preparation of the overall plan for the operation to include the fire support annex. The CJATF is also responsible for the coordination of all supporting arms until such time as the landing force coordination agencies are established ashore and responsibility for fire support coordination passes from the CJATF to the landing force commander (CLF). The CJATF exercises planning for fire support and coordination responsibilities through a supporting arms coordination center (SACC) established on his flagship. The staff officer responsible to the CJATF for fire support coordination and planning is a naval officer and is designated as the supporting arms coordinator (SAC). The functions of the SACC and SAC parallel those of the fire support element (FSE) and the fire support coordinator (FSCoord).

b. *Supporting Arms Available to the Landing Force.* At all times one or more supporting arms will be available to the landing force and its assault elements for attack of targets. Field artillery is not generally available to support troops in the initial phase of the amphibious assault, and fire support is delivered by air and naval gunfire. After the early landing of field artillery, support is delivered by all three arms. Except for such objectives as islands or peninsulas, naval gunfire will not continue to be available throughout the operation and, because of the distances involved, it may not be able to support the objectives of airmobile forces in the initial phases of the operation. Aircraft are limited by conditions of weather, visibility, and certain conditions of terrain as in normal land warfare.

c. Fire Support Planning Responsibilities.

(1) The amphibious task force commander is responsible for:

(a) Coordinating the planning for the employment of all air, naval gunfire, and field artillery support.

(b) Preparing coordinated naval gunfire and air fire support appendixes for all phases of the operation.

(c) Planning for the establishment of a supporting arms coordination center at each appropriate level in the amphibious task force upon arrival in the objective area.

(2) The landing force commander is responsible for:

(a) Establishing at the beginning of the planning, at each appropriate level of the landing force, a fire support agency for the discharge and implementation of landing force coordination responsibilities throughout the planning phase and execution of the operation.

(b) Determining the air, naval gunfire, and field artillery support requirements of the landing force and for assuring that the requirements are integrated with the planned maneuver of the troops.

(c) Coordinating the requests for field artillery, naval gunfire, and air support for the landing force.

(d) Presenting coordinated requests for naval gunfire and air support to the amphibious task force commander.

(e) Preparing the field artillery fire support appendix.

(f) Disseminating of pertinent portions of the amphibious task force naval gunfire support appendix and air fire support appendix to elements of the landing force. Normally this is accomplished by publishing naval gunfire and air fire support appendixes to the landing force fire support annex.

d. Fire Support Planning and Coordination Procedures.

(1) *Planning procedures.* Upon receipt of the initiating directive, liaison is established between the naval, air, and landing force troop commanders involved at each level of command. Field artillery, naval gunfire, and air officers on the staffs of all commands involved must be kept fully informed of the status of planning.

(2) *Fire support requirements.* The CLF submits to the CJATF his consolidated requirements for air and naval gunfire to support his scheme of maneuver ashore. The CJATF consolidates these requirements with the naval requirements for fire support and compares the overall requirements with the fire support means made available in the initiating directive. Based on this comparison, the CJATF allocates the ships and aircraft. If the fire support requirements cannot be met, the CJATF must request more ships and

aircraft or request the CLF to reevaluate his fire support requirements.

(3) *Fire support coordination afloat and ashore.* The fire support coordination agency (FSE/FSCC), functions throughout the execution of fire support activities. Supporting arms representatives in the FSE/FSCC plan and coordinate fires, integrate the fire support means with each other and with the support elements of the landing force, and implement restricted measures as required. These tasks are performed under various conditions and situations during the period afloat and after establishment of the FSE/FSCC ashore. While afloat, the FSE/FSCC operates in conjunction with the supporting arms coordination center (SACC) and reviews the requests of landing force elements ashore, monitors the fire support activities, and plans additional requirements. The FSE/FSCC representatives in the SACC make appropriate recommendations regarding troop safety and the type and means of delivery and record all target information for future reference ashore. The planning of additional fire support requirements by landing force representatives in the SACC is accomplished concurrently with the execution of previously planned and scheduled fires to insure adequate and effective fire support of tactical operations ashore. With the approval of the CJATF, the control of supporting arms is passed to the landing force commander on installation of the landing force FSE/FSCC elements ashore. When control and overall responsibility for coordination are passed ashore, the CLF becomes responsible for the overall planning, coordination, and control of fire support means available in the objective area.

7-6. Embarkation Planning

Planning considerations for embarkation are discussed in FM 60-30. The principles and techniques involved in the embarkation of field artillery for amphibious operations as discussed in *a* through *d* below, supplement the embarkation planning considerations set forth in FM 60-30. Embarkation requires careful attention to detail in planning and execution.

a. Organization for Embarkation.

(1) *Technique of embarkation.* The following techniques will generally be observed in the organization of field artillery units for embarkation and in the execution of the embarkation:

(a) Field artillery organizations are normally formed together for embarkation. Field artillery units in direct support of or attached to

other organizations of the landing force are embarked with the supported unit.

(b) The division artillery normally is the nucleus for embarkation of field artillery.

(c) When landing force field artillery units are assigned to the division for embarkation, they normally are specifically assigned to the division artillery for embarkation.

(d) Regardless of the organization for embarkation and combat, the following personnel are embarked with elements of the landing force as indicated:

1. The fire support element/fire support coordination center personnel are embarked with the supported maneuver commanders.

2. Artillery air observers (AO) and pilots are normally embarked in the ships transporting the artillery observation aircraft.

3. Liaison teams provided to support maneuver units are embarked with the headquarters of these units.

4. Forward observer teams are embarked with the maneuver units which they normally support.

5. The remainder of the field artillery should be embarked in such a manner as to maintain the tactical unity of the organizations.

(2) *Embarkation unit.* An embarkation unit is usually built around the field artillery organization of the division. If the landing force is a corps, embarkation units may be necessary for corps artillery as well as the division artillery. (See FM 60-30).

(3) *Embarkation team.* The embarkation team consists of the troops, equipment, and supplies embarked in a single ship. Field artillery weapons, prime movers, and weapon crews are loaded on the same ship to facilitate training and maintenance while under way. Field artillery to be landed by airmobile means should be loaded aboard the amphibious assault ship (LPH) with the supported maneuver unit. Units must be loaded in a manner which permits unloading according to the tactical plan. (See FM 60-30).

b. *Embarkation Responsibilities.* The estimate of field artillery requirements (para 7-4d) provides the basis for the preliminary determination of shipping requirements. The final determination is based on embarkation data submitted by the field artillery units; it is included in the totals of shipping requirements for the landing force and is presented to the amphibious task force commander.

c. *Shipping Requirements.* Requirements are determined by the field artillery unit commander

based on the landing plan; the amount of field artillery, ammunition, supplies, and equipment to be transported; and the number of personnel involved.

(1) *Airmobile artillery.* Airmobile artillery normally should be embarked in LPH or amphibious transport dock (LPD) type ships.

(2) *Waterborne artillery.* Waterborne artillery is normally embarked in tank landing ship (LST), dock, landing ship (LSD), or LPD type ships. When it is desired to land artillery by utility landing craft (LCU), landing craft mechanized (LCM), or landing vehicle, tracked, personnel (LVTP), the equipment should be preloaded in these craft aboard the LSD's or LPD's. The LST normally is beached or is married to a causeway for landing. Weapons should not normally be loaded in attack transport (LPA's) or attack cargo ships (LKA's), unless limitations dictate that these ships be used.

(3) *Loading details.* Details for loading should be obtained from pamphlets which describe the characteristics of the ships. As early as possible in the planning, the stowage areas, holds, and decks are inspected to insure that embarkation data is correct.

(4) *Loading plan.* The team embarkation officer, assisted by the ship combat cargo officer when possible, under the supervision of the embarkation team commander, prepares the loading plan. The embarkation team commander and the ship's commanding officer approve the loading plan before loading commences; they approve subsequent changes to the plan before the changes are effected. (See FM 60-30.)

d. *Embarkation of Units.* The organization for embarkation should preserve the tactical integrity of the task units as established in the organization for combat and should facilitate their entry into combat. Field artillery elements in direct support, or attached, are embarked with the units they are supporting. Batteries and battalions in general support are usually organized as separate embarkation teams to facilitate control. Dispersion of firing elements in assault shipping provides a measure of security against losses at sea. This dispersion should be carried out only to the extent that control of units is not unduly hampered.

(1) *Loading considerations.* The following considerations should receive special attention in the preparation of embarkation plans:

(a) Material must be accessible for maintenance.

(b) Prime movers should be stowed with the field artillery pieces.

(c) Slings for field artillery pieces and vehicles must be carefully adjusted to prevent damage to the equipment.

(2) *Landing considerations.* Early entry into action is insured by embarkation of light field artillery on LPH's movement ashore by helicopter or preloaded vehicle or craft. The early beaching of landing ships provides the most efficient entry into action. Medium and heavy field artillery units can normally enter combat at the required time by landing from LST's that have been beached or married to the causeway. Flexibility is necessary. The following considerations should receive special attention.

(a) Reconnaissance parties must be landed early.

(b) The composition of the reconnaissance parties should provide for the establishment of survey control and communications, the selection of position areas and beach exits, and the employment of route guides and markers.

(c) Firing units and fire direction and command elements should be loaded to expedite emplacement and to provide centralized fire direction at the earliest possible time.

(d) Organic elements such as survey, meteorology, and radar, must be loaded to provide for their earliest employment.

(e) Adequate security and control must be provided for movement from the beach to position areas.

(f) Plans must include measures to insure rapid off-loading and to prevent over-crowding of the beach area.

(g) Alternate assembly areas and position areas must be planned.

7-7. Administrative Planning

Administrative planning for field artillery units does not differ significantly from such planning for other units in amphibious operations. For information concerning administrative planning in amphibious operations see FM 31-12.

7-8. Field Artillery Employment in Amphibious Operations

a. *Special Considerations.* During the planning phase, the artillery commander and his staff carefully analyze the area of operation, the situation, the logistics support available, and the concept of operations in developing staff estimates for the landing force commander. Special emphasis must

be given to certain considerations peculiar to the employment of artillery in amphibious operations. These considerations include—

(1) *Aggressiveness.* The field artillery must be employed boldly in an amphibious assault as a requisite to early support of the landing force. Measures normally considered essential to security in land warfare are often sacrificed in the amphibious operation. The necessity for early entry into combat to provide the required fire support will often place the field artillery adjacent to other units in crowded and compact position areas. The absence of defilade and the construction of protective positions cannot be allowed to delay the entry of field artillery into combat. Nevertheless, units should not be landed or committed to action in areas subjected to intense small-arms fire. Field expedients based on experience may have to serve as substitutes for normal means of accomplishing tasks. Forward observers must be capable of calling for and adjusting naval gunfire until the field artillery has landed and, if necessary, at other times. The talents of naval gunfire personnel are exploited in planning, coordinating, and adjusting artillery fires when naval gun fire support ships are beyond range or no longer available. Various means (helicopters, landing craft, LVTP's causeways, etc.) are used for landing and displacement, particularly in providing fire support from offshore islands and promontories or in unusual situations created by the characteristics of the area.

(2) *Concept of fire support.* In stating his concept of operations, the landing force commander states his requirements for fire support. A concept of fire support is generally evolved from the field artillery estimate of supportability and other staff estimates provided by air and naval gunfire agencies. It is a statement of the broad outline of the commanders intent regarding the provision of supporting fire for the landing and for subsequent operations.

(3) *Concept of logistics support.* The concept of logistics support for field artillery must complement the concept of fire support in order to provide for the most effective employment of field artillery. The concept of logistics support is based on the capability of the service support agencies of the landing force as well as the concept of the operation. Consideration must be given to ammunition, maintenance, replacement, and resupply problems envisioned during the amphibious operation. The logistic capability of the field artillery organization must be exploited to overcome any problems that arise prior to the

landing and installation of logistic agencies of the landing force.

(4) *Organization for combat.* The fundamentals of organization for combat for an amphibious operation do not vary significantly from those applicable to organization for combat in land warfare; however, the separation of tactical units that often characterizes modern amphibious operations will sometimes require the attachment of direct support field artillery units or certain of their elements to battalion landing teams and brigade landing teams. When the landing force is comprised of a single division or a smaller unit, all field artillery assigned to the landing force should normally be attached to the senior artillery headquarters with the force. When the landing force controls more than a single ground tactical element, a separate landing force field artillery headquarters is generally established.

(5) *Organization for embarkation.* The organization for embarkation must facilitate the concepts of the operation, fire support, and logistics to the extent that entry into combat, effective fire support, and sustained operations can be accomplished (para 7-6).

(6) *Type of control.* The organization for combat should permit the maximum practical degree of centralized control consistent with the commander's concept. The attachment of units and elements to assault maneuver battalion landing teams and brigade landing teams requires that flexibility of control exist and that varying degrees of centralized and decentralized control be exercised over the subordinate artillery units. Field artillery commanders should not hesitate to decentralize control when it will accelerate entry into action, permit more effective employment, or when necessitated by the situation, but reestablishment of centralized control at the earliest possible time at the highest artillery level is desirable.

(7) *Fire support coordination.* Coordination of supporting arms is particularly difficult during the initial assault until the landing area has been sufficiently expanded to allow sufficient area for maneuvering fire support. Therefore, the coordination of fire support must be given special attention during the planning phase.

(8) *Communication.* Comprehensive communication plans are issued by the battalion and by higher artillery units to insure effective communications during the critical period of the assault and subsequent operations ashore.

b. *Subsidiary Landings.* The inability of field artillery to support the initial amphibious assault

constitutes its greatest limitation. When possible, the installation of field artillery on off-shore islands or promontories for support of landing operations is desirable. Subsidiary landings for the purpose of seizing suitable position areas may be conducted when such islands or land areas are located within field artillery range of hostile defenses. Subsidiary landings are planned and conducted with the same care as that given to planning for the main landing.

(1) *Seizure prior to main landing.* When the seizure is made prior to the main landing, the element of surprise is generally sacrificed; however, the additional fire support may contribute a greater measure of assurance of success to the amphibious assault of the beach. This is particularly true when insufficient naval gunfire is available or the loss of gunfire support ships may occur during this critical phase.

(2) *Seizure subsequent to main landing.* Subsequent seizure of areas for installation of field artillery by subsidiary landings may be made either by ship-to-shore or shore-to-shore techniques. Seizure of such positions is generally desirable to provide support not otherwise available, to deny these areas to the enemy, to deceive and demoralize the enemy, and to lend impetus to the landing force's attack.

(3) *Planning of subsidiary landings.* Diversion of elements of the landing force for subsidiary landings is justified when the value of the subsidiary operations is more significant than the contribution the same elements would make to the main landing or attack. Additional planning for displacement, resupply, and linkup or rejoining of field artillery occupying position areas seized in subsidiary landing operations must be planned to insure continuous and uninterrupted fire support for the main landings and subsequent operations ashore. A loss or reduction of field artillery support may occur for the period of displacement; i.e., the time necessary to embark, land, and emplace the units involved. The landing force commander may, however, preclude this loss or reduction of artillery support by including in the artillery organization for combat the necessary additional units to participate in any foreseeable subsidiary landings.

c. *Rehearsal.* The purpose of a rehearsal is to test the adequacy of the landing plans, the timing of detailed operations, the combat readiness of participating forces, and the adequacy of communications and to insure that the participating units are familiar with the operation.

(1) *Planning.* The planning should insure that the rehearsal will adequately accomplish its purpose.

(2) *Briefing.* Prior to the rehearsal, detailed briefings should be held to insure thorough understanding of the field artillery support. Field artillery personnel, such as observation and liaison teams, who are embarked with other units must be briefed prior to the embarkation.

(3) *Type of rehearsal.* The type of rehearsal conducted will determine what elements, personnel, and materiel will participate. Integrated rehearsals normally include field artillery personnel at all levels. This is the opportune time to test field artillery communications between forward observers, the field artillery command groups, and the fire support coordination and fire direction agencies. Normally, field artillery weapons are not landed during the rehearsal.

(4) *Critique.* Primary consideration is given to an evaluation of communications, special techniques, and time-space factors. If the critique is conducted ashore, it is advisable to include the field artillery forward observers and liaison officers. This will enable them to be fully aware of any changes in the artillery plans and to provide additional commentary.

d. Movement to the Objective Area. The movement to the objective area is that period of time between departure of the amphibious task force from the ports of embarkation to the arrival of the components of the amphibious task force in their assigned positions in the objective area.

(1) *Communications security.* Communications silence is normally imposed during movement to the objective area. Communications restrictions impose severe limitations on the field artillery commander in that he will not possess organic communications with personnel embarked in other shipping. Artillery personnel must be thoroughly briefed on communications security prior to the time of embarkation and they must be given adequate opportunity to test organic equipment and nets prior to the landing.

(2) *Training.* Emphasis is placed on combat indoctrination, and briefings in all aspects of the operation. Physical drills should be conducted daily insofar as the ship's facilities will permit. Field artillery personnel should be briefed as to the landing plan, scheme of maneuver ashore, location of field artillery position areas, zones of fire, and road networks. Dominating terrain features that may provide orientation, suitable locations for artillery installations, or a degree of protection from enemy fire and observation

should be stressed. Technical training should be conducted commensurate with the space and facilities available to the field artillery unit.

(3) *Maintenance.* Equipment and materiel must not be allowed to deteriorate during the movement; carefully supervised maintenance is performed throughout the movement. Dampness and salt water require that special care and cleaning be given weapons, communications equipment, vehicles, and supplies while under way.

(4) *Discipline.* Disciplinary problems are normally of minor consequence during the movement to the objective area; nevertheless, discipline must be enforced during the movement.

e. Operations and Intelligence En Route. During the movement to the objective area, the commander and his staff continually review the plan of operations and fire support. Current intelligence is provided by reconnaissance activities, the supporting arms coordination center (SACC), and higher headquarters. Recommendations for changes in the artillery support must be made in light of intelligence relating to the characteristics of the objective area, the enemy situation, and enemy capabilities or as dictated by modifications to the scheme of operations. Planning for the destruction of additional targets and elimination of targets to be destroyed by other fire support means are accomplished based on target assessment information provided by the SACC representative. A continued program of counterbattery intelligence should be carried out at all levels of artillery in order to provide adequate counterfire measures and to determine the appropriate tactical disposition of firing units. Review of the artillery support in respect to any foreseen eventualities and the action that would be necessitated is made throughout the movement to the objective area. Loss of shipping with field artillery units embarked requires reassignment of tactical missions and modifications to the landing plan.

f. Amphibious Assault.

(1) *General.* Field artillery units are landed as soon as conditions on the beachhead or landing zone permit. Sufficient time to permit reconnaissance parties to complete essential tasks must elapse before firing elements are landed. Field artillery units supporting waterborne assault units are landed on call in most operations, thus giving the artillery commander flexibility in determining the actual time of landing. On-call field artillery is normally landed on order of the landing force commander based on the recommendation of the field artillery commander.

(2) *Ship-to-shore movement.* Field artillery units should be prepared for an early landing and entry into action; however, they must not be landed until position areas are cleared of any small-arms fire that could prevent the delivery of continuous fire support for the assault units. Certain field artillery elements, such as forward observation teams and liaison teams embarked with the supported infantry organization, must land prior to the field artillery weapons. Reconnaissance parties, including survey and communications personnel sufficient to expedite the reconnaissance, selection, and occupation of position, are scheduled early in the landing sequence of field artillery elements.

(a) *Waterborne field artillery.* The time of landing field artillery units depends on such variables as availability of position areas, requirements for field artillery ashore, and the ability to beach the larger landing craft and landing ships. The exact place of landing is contingent on such factors as beach conditions, beach exits, and road nets to the position areas. The normal sequence of landing is discussed in 1 through 4 below:

1. *Observation and liaison elements.* Forward observers land with the rifle companies and liaison personnel land with the battalion and brigade landing team command groups. They keep the appropriate artillery commanders informed of the situation ashore, including the location and suitability of landing beaches, the location and condition of exits from the beaches, and the condition of preselected position areas, and make appropriate recommendations.

2. *Reconnaissance elements.* Field artillery reconnaissance parties are landed as early as the tactical situation ashore permits. These parties are composed of battery and battalion commanders, communication personnel, survey personnel, guides, and sufficient personnel to provide initial local security.

3. *Firing elements.* As soon as possible, battery and battalion commanders request that their units be landed. To insure early entry into action, commanders must estimate the time and space factors involved and initiate their requests in advance of the anticipated time the position areas are expected to be suitable for occupation.

4. *Headquarters and headquarters and other elements.* After the firing units are ashore, the vehicles, supplies, and personnel still afloat are phased into position areas and command posts as soon as practicable.

(a) *Communications.* The normal nets used in the displacement of a unit ashore are generally sufficient to control the ship-to-shore movement.

(b) *Ammunition.* Ammunition resupply is initially delivered directly to the firing units. Designated amphibious vehicles, after landing the firing units, may be utilized to transport ammunition directly from the ships to the position areas.

(b) *Airmobile artillery.* Airmobile artillery employed in amphibious operations is normally attached to the supported infantry in order to facilitate planning and execution. The sequence of landing airmobile artillery elements is discussed in 1 through 4 below. The techniques of employing airmobile artillery in amphibious operations are similar to those used for employing airmobile artillery in operations ashore.

1. *Observer and liaison elements.* The forward observer teams and liaison parties land with the supported maneuver units.

2. *Reconnaissance elements.* The reconnaissance party must land as early as possible and is usually included in one of the early helicopter waves.

3. *Firing elements.* Firing units may be landed on call or according to a schedule as in an airmobile operation. The artillery commander may recommend that the landing of the artillery be delayed or moved up according to the situation in the landing area. Alternate landing zones and position areas are considered to prevent delay in the delivery of fire support.

4. *Other elements.* The remaining elements are landed as soon as practicable and as the tactical situation permits.

(a) *Communications.* The field artillery commander does not have adequate communication means to control his unit during the airmobile movement. The time required for the airmobile movement is of relatively short duration; therefore, the limitation on communications is acceptable for the brief period.

(b) *Ammunition.* Priority must be given to the movement of an adequate initial supply of ammunition. Resupply flights are continued with helicopters until the specified level is reached. The ammunition level is maintained by timely request or automatic ammunition resupply flights. Additional quantities of ammunition are palletized in helicopter loads and are ready on an on-call basis aboard the LPH or any designated am-

phibious supply point in the beachhead. Ammunition is landed in position by helicopter until ground transportation is available to the field artillery unit for moving it.

(c) *Transportation.* Airmobile operations normally limit the amount of organic transportation lifted. The supported airmobile force to which the field artillery unit is attached should be aware of the transportation requirements and provide such additional means that may be within the landing force capability. When linkup operations are contemplated, organic artillery transportation, equipment, and personnel which were not helicopter lifted into an area of operations are brought overland.

(3) *Control.* Control of field artillery is decentralized at the time of embarkation and remains so during the movement to the objective area. Preparations must be made for the resumption of centralized control as soon as practicable after arrival in the objective area.

(a) *Ship-to-shore phase.* At the appropriate time after completion of his reconnaissance, the artillery battalion commander, using the division artillery command net, requests from the division artillery commander that his battalion be landed. The firing units of the battalion, which are still afloat, and the artillery representative in the tactical-logistical (TACLOG) group monitor the division artillery command net, thus, the battalion commander's request to the division artillery commander alerts the firing units and the TACLOG group to initiate preparations to land. The order to land emanates from two sources. The landing force commander issues the order (authority may be delegated to the landing force artillery commander) through channels to the subordinate commanders and to the artillery representative in the TACLOG group, and the amphibious task force commander issues the order to the control ship and the ships in which the firing units are embarked. The TACLOG group then coordinates the actual landing with the appropriate naval control officer.

(b) *Nonscheduled units and supplies.* Control of the landing of nonscheduled units and supplies may be decentralized to permit subordinate commanders to send requests directly to the shore party to land nonscheduled artillery units and supplies. The shore party relays these requests to the TACLOG group and the TACLOG group notifies the appropriate naval control officer. The naval control officer issues the necessary order to land the requested unit and supplies.

(c) *Initial control ashore.* Direct support artillery is the first artillery to land. The need for centralized control by the landing force artillery commander is not significant during this period; therefore, decentralized control is dominant in field artillery tactics and techniques during the initial stages of the landing.

(d) *Subsequent control ashore.* To provide centralized control of firing units after the initial stages of the landing, it is necessary that the parent unit fire direction center land early, preferably at the same time that the units which it controls land. As the general support artillery units land, the need for centralized control of artillery increases. The parent unit fire direction centers (force, group, and division artillery) are established ashore as rapidly as the situation will permit. The degree of centralization is influenced by the capability to communicate and to mass fires and by the tactical missions of subordinate elements.

(4) *Initial employment ashore.* The initial employment of artillery ashore is influenced by limitations imposed by the terrain, compact position areas, and the proximity of multiple tactical and support installations. Detailed information concerning gunnery is required to insure accuracy and to facilitate the massing of fires. The following gunnery and tactical considerations are evident:

(a) *Fire direction.* Initially, the battery, and possibly the battalion, fire direction center is the highest echelon capable of exercising centralized control of fire direction. Centralized fire direction is established by the parent unit at the earliest opportunity. Fire direction is facilitated by the proximity of subordinate firing elements and resultant good communications.

(b) *Zones of fire.* Zones of fire are assigned to insure coverage of the entire front and to permit the massing of fires in critical areas when necessary. Artillery and naval gunfire zones of fire are integrated to avoid unnecessary duplication of effort.

(c) *Position areas.* The initial position areas are selected from careful map and photo reconnaissance. The primary considerations in the selection of initial position areas is that each unit must be capable of executing its assigned mission. Alternate position areas are selected and planned in the event the primary selected area cannot be occupied.

(d) *Gunnery control.* Detailed gunnery information is provided to subordinate units in appendixes and SOP's.

(e) *Reconnaissance.* Field artillery commanders of all echelons involved in amphibious operations employ larger reconnaissance parties in the initial phase ashore than in subsequent operations.

(f) *Target information.* The artillery representative to the Navy supporting arms coordination center provides the field artillery commander with target information and target assessment. During the initial phase, the targets located and fired on are coordinated through the supporting arms coordination center. All target information is passed to the fire support element/fire support coordination center so that activity will have a complete record and target file when control is passed ashore. In addition, all Navy and landing force intelligence agencies and sources are utilized to locate potential artillery targets. A target list is distributed by the amphibious task force and is supplemented by current target bulletins. The fire direction centers and the fire support elements/fire support coordination centers keep their target lists current by use of the periodic bulletin, by liaison with the intelligence agencies, and by close scrutiny of dam-

age assessment reports. Organic artillery target acquisition agencies are emplaced and begin functioning as soon as possible.

(g) *Observation.* Artillery air observers must use ship-based aircraft until Army observation aircraft are located in the beachhead.

(h) *Naval gunfire.* Close coordination is of particular significance in the initial phase when field artillery has not yet been landed and increased reliance must be placed on naval gunfire support to meet troop requirements for close supporting fires.

(i) *Counterbattery.* During the early period of the amphibious assault, the division artillery commander/artillery battalion commander may be assigned responsibilities for counterbattery activity. When the landing force field artillery headquarters begins functioning ashore, the primary responsibility for counterbattery activities is centralized at force artillery headquarters.

7-9. References

For additional details on amphibious operations refer to FM 31-11, FM 31-12 and FM 60-30.

Section III. NIGHT OPERATIONS

7-10. General

The fundamentals of fire support are unchanged for periods of reduced visibility. However, operational techniques must be modified to allow for the inherent capabilities and limitations of available fire support elements (artillery, mortars, naval gunfire, tactical air, armed helicopters) during periods of darkness. The problems associated with mobility, target acquisition, and fire support coordination are increased during these periods. Proper employment of appropriate night operational techniques, night vision aids, and target acquisition equipment will increase effectiveness during night operations. A complete discussion of night operations is presented in FM 31-36. (Test).

7-11. Fire Support Coordination

Fire support coordination techniques apply equally during daylight and darkness. The visual control and navigation problems during periods of darkness increase the requirement that unit locations be reported, posted on battle maps and firing charts, and continually verified. Artillery

and mortars or naval gunfire may be used as navigational aids. Available night vision, ground surveillance, and illumination means may be used to mark boundaries, checkpoints, limits of advance, and target locations.

7-12. Artillery (Mortar) Unit Operations

a. *General.* Night operational techniques are applicable to all field artillery and mortar units. A detailed discussion of movement and of reconnaissance, selection, and occupation of position is contained in chapter 4, FM 6-140. Unit SOP's must include details for all phases of night operations.

b. *Displacement.* Fire support units are prepared to displace under all conditions of visibility to support the ground tactical plan. Unit SOP's must include the techniques of blackout driving and the techniques of operation of available night vision equipment, such as electronic binoculars and metasopes. Airmobile units prepare the SOP for heliborne operations during periods of reduced visibility.

c. *Night Occupation and Organization of Position.* See paragraph 66, FM 6-140.

7-13. Adjustment of Fire

a. Adjustment of artillery, mortars, and naval gunfire during daylight reduces the need for adjustment at night. Adjustment techniques used in dense jungle and rugged terrain are applicable at night. All observers must become proficient in techniques which will aid them during periods of reduced visibility; that is, adjustment by sound, adjustment under illumination, and utilizing WP shells as marking rounds. Available active infrared devices may be used to signal other friendly elements or aerial observers. Each type of night vision aid may be employed to assist in surveillance, navigation, and target acquisition.

b. The aerial observer has the same basic problems at night as the ground observer. Through the use of available searchlights with both visible and infrared illumination, illuminating projectiles, and flares, the aerial observer can more easily detect enemy activities. Using night vision devices, he can often increase his observation capabilities, although vibrations and reflections from aircraft windows create difficulties with this equipment. The aerial observer is often invaluable as a radio relay at night.

c. The ground and aerial observers, using a common radio net, should work as a team to overcome their respective limitations. After locating friendly elements on the ground, the aerial observer may "creep fire in" until the ground observer is able to spot the rounds and control the adjustment visually or by sound.

7-14. Fire Planning

a. Survey and registration should be completed during daylight hours, if possible. If a flash base can be established, a high-burst or mean-point-of-impact registration may be conducted after dark. All plans must be simple and well coordinated. The possibility of sacrificing surprise should be considered when planning any fires in support of a night operation.

b. Detailed fire planning is required for well-executed night operations. Harassing and interdiction (H&I) fires upset the operations of the enemy and reduce his mobility. Defensive targets should be adjusted prior to darkness on avenues of approach and gaps in fields of fire and observation.

c. Fires may be scheduled or placed on call during night operations to—

(1) Isolate the friendly zones of attack and the objective.

(2) Interdict likely ambush sites.

(3) Discourage the enemy's use of snipers and command-detonated mines.

(4) Protect the rear of a column from followers.

(5) Protect vulnerable flanks.

(6) Assist in navigation.

(7) Harass and interdict.

(8) Illuminate areas of concern.

d. Preparations often are not used at night, particularly when the supported attacking force is moving by stealth. However, preparation and blocking fires should be planned and be available on call. Often, preplanned fires may be used on alternate objectives as a ruse or to add to the enemy's confusion. When exact enemy locations are unknown, large areas may be reconnoitered by fire by use of artillery or mortar zone and sweeping techniques.

7-15. Countermortar/Counterbattery Fire

a. Should the enemy launch a night mortar attack delivering large quantities of ammunition in a short time, a detailed countermortar plan that can be rapidly executed is essential to defeat this threat.

b. The countermortar plan should include use of all available fire support means. Targets are plotted on possible mortar locations and avenues of approach. Sectors of the areas are assigned to the available fire support units commensurate with their respective direction of fire and range capabilities. Should a mortar attack occur, all or portions of the countermortar program may be fired by target or assigned sector. The direction from which the mortars are firing will indicate which portions of the countermortar program should be fired. The actual or suspected locations of enemy mortars should be immediately engaged.

c. Available radars, observation posts, and listening posts should be coordinated to report incoming rounds, flashes, or sounds of firing. Personnel should be proficient in rendering shell reports. Appropriate communications are established to reduce delays. Often, outgoing artillery and mortar fire create clutter for radars and confuse observers. A technique for rapidly checking firing should be established. An aircraft should be kept on alert so that it may be airborne in time to detect enemy mortar muzzle flashes. All countermortar plans must be coordinated and tested to provide for minimum reaction time.

7-16. Aerial Fire Support

The employment of tactical air, attack helicopters, and aerial field artillery in support of night operations requires detailed planning and coordination because of the difficulties in target identification, location of enemy troops, and control. Cannon artillery and mortars generally are preferable for close support during periods of reduced visibility.

a. All available illumination and night vision devices should be considered for employment in determining the locations of friendly troops and in identifying targets. Once the pilot or forward air controller (FAC) identifies the friendly locations, a target may be designated by an azimuth and distance (polar plot) from an easily identifiable point. Care should be taken not to disclose friendly positions. Searchlights, illumination rounds, and air-dropped flares aid in troop and target identification and control. Detailed planning and coordination is essential to preclude blinding pilots or unnecessarily sacrificing security.

b. The starlight scope, mounted on a rifle or

machinegun, may be used by helicopter door gunners or observers to acquire and engage targets. The targets are marked by tracer rounds for further engagement by other armed aircraft.

c. Searchlight and floodlight subsystems may be attached to helicopters to facilitate the employment of attack helicopters at night.

7-17. Nuclear and Chemical Fires

The employment of nuclear and chemical fires in support of night operations is basically the same as in support of daylight operations. The loss of surprise and the adverse effects of nuclear and chemical weapons should be considered in greater detail. Problems peculiar to night operations in a nuclear or chemical environment are obstacles, dazzle, loss of night vision, decreased command and control or diminished effective use of optical equipment while wearing the protective mask, and target acquisition. A detailed discussion of the employment of nuclear weapons is contained in the FM 101-31-series manuals; the FM 3-10-series manuals contain detailed information on the employment of chemical weapons.

Section IV. MOUNTAIN OPERATIONS

7-18. General

The standard artillery units of corps and divisions can operate successfully in mountains, although mountain warfare imposes special problems concerning mobility, fires, communications, and tactical employment (FM 100-5). Personnel working in high altitudes require more frequent rest periods because of the decrease in oxygen. Commanders must consider this additional time factor when planning for mountain operations. This section summarizes the problems which require particular attention in mountain operations. See FM 31-71 and FM 31-72 for details on artillery operating in mountains.

7-19. Mobility

The surface movement of artillery, in general, is restricted to roads and improved trails. In mountainous areas, the scarcity of adequate roads and trails limits the choice of avenues of approach to the extent of canalizing the movement of artillery. In addition, the winding roads and steep slopes, which are characteristics of mountainous areas, create difficulties in turning towed weapons and in getting them into and out of positions. Towed light artillery can sometimes be manhan-

dled under these conditions. Helicopters can be used to transport towed light and medium artillery into areas that have no access roads. Self-propelled artillery, although able to negotiate sharp turns and to ascend and descend steep slopes, is hampered by tracks slipping on icy roads.

7-20. Fires

a. Artillery fire is not as flexible in mountainous terrain as on the plains because the choice of positions is restricted and masks are high. However, howitzers are well suited to mountain warfare because of their arcing trajectories. High-angle fire is employed frequently to reach over masks, behind crests, and into deep valleys. Adjustment of fires on targets located on peaks and reverse slopes is difficult. Guns, with their flat trajectories, cannot be used close to the front except in direct fire roles. Normally, guns are employed far enough to the rear to take advantage of an increased slope of fall. Some artillery may be moved forward to provide long-range interdiction fires.

b. Most artillery fires in the mountains must be observed, especially close support and defensive fires. Observation parties may require aug-

mentation to assist in carrying equipment. Aircraft and helicopters increase the range of observation and permit searching of areas into which ground observers cannot see.

c. Unobserved fires are generally unreliable in the mountains. Meteorological conditions change rapidly, and registration corrections for high-angle fire are valid for only short periods. Effective transfer of fires is difficult, since altitudes within transfer limits vary greatly. Often, a check round should be fired in the vicinity of a target before fire for effect is delivered on the target.

7-21. Ammunition

Impact, high-explosive ammunition is effective in rocky ground, since it scatters stones which, in themselves, become missiles. However, protracted bombardment of defensive positions in the mountains with impact explosives produces few enemy casualties. Artillery fires may be used to initiate rockslides or snowslides to block supply routes or engulf enemy defenses. Variable time and time fuzes are effective, particularly against enemy troops on reverse slopes. Smoke is used but is difficult to control because of winds. For information concerning nuclear weapons effects in mountains, see the FM 101-31-series manuals; the FM 3-10-series manuals contain information concerning chemical weapon effects.

7-22. Targets and Target Locations

a. Passes and defiles which form bottlenecks in the enemy supply route are ideal targets for artillery interdiction fires. Since the defender is usually dispersed in small groups, massed fires of many artillery weapons is seldom effective and is expensive.

b. Direct observation by ground or aerial observers is the most reliable means of locating targets in the mountains. Ground observers usually will be restricted in observation to the next hill mass. Deep defilade makes it difficult to locate enemy weapons. Army aviation should be used to

search areas defiladed from ground observation. However, high-performance aircraft have difficulty in performing observation missions while avoiding mountain hazards. Much reliance must be placed on shell reports because of the inefficiency of radar and sound ranging equipment in the mountains. Radar surveillance is adversely affected by ground clutter, and sound ranging is difficult because of echoes. Maps and aerial photographs disclose probable gun locations, since the enemy is also restricted by terrain limitations, in his choice of gun positions. Deep shadows and uneven illumination increase the difficulty of interpreting aerial photographs.

7-23. Control

Terrain compartmentation often requires the use of multiple maneuver columns in the attack. Small forces require artillery support, and decentralization of control of artillery may be necessary to provide support for all columns. Elements of general support artillery units may be detached in order to provide support for units that are separated by terrain features. However, this procedure tends toward decentralization and loss of control and should not be used unless absolutely necessary to provide artillery support.

7-24. Communications

Main wire routes are restricted to roads, and wire lines are vulnerable to breaks caused by enemy artillery or friendly traffic. Cross-country wire is difficult to maintain and is often broken by rockslides and snowslides. The use of Army aircraft to lay and maintain wire during mountain operations aids in solving this problem. Radio communication is used extensively. Care must be exercised in the selection of sites for antennas of very-high-frequency sets, either AM or FM, because of the line-of-sight characteristics of high-frequency radio waves. The use of relay stations (either ground or air) is more prevalent in mountainous terrain.

Section V. JUNGLE OPERATIONS

7-25. General

Jungle combat is designated a special operation primarily because the inherent difficulties of terrain, climate, and visibility complicate the vital problems of command, control, movement, communications, supporting fires, target acquisition, supply, and evacuation. Normal procedures must

be modified, and specialized equipment may be required. Training for jungle operations includes thorough indoctrination on living in the jungle, personal hygiene, care of equipment, and the advantages and disadvantages of jungle warfare (FM 31-30). Areas requiring special attention by the artillery command in support of jungle opera-

tions are mobility, observation, positions, fires, logistics, ammunition, communications, survey, and security.

7-26. Mobility

a. Conditions encountered in jungle operations impose greater restrictions on the movement of artillery than those encountered in other types of operations. Suitable roads and improved trails are almost nonexistent away from settled areas, and the few that do exist often become muddy quagmires. Roads must be constructed as the movement progresses, and, due to the lack of materials suitable for road construction, their use is usually limited to light trucks or light tracked vehicles. Dense vegetation, unstable soils, and poor drainage make road construction difficult. Roads must be maintained continually to insure continuous movement of vehicles and supplies, since jungle growth quickly reclaims neglected or abandoned roadways. Engineer support is initially required to establish a trail or roadnet of even minimum standards. Carpenter's tool sets, portable power tools, and chain saws are particularly useful for clearing jungles and for road construction. Special equipment is needed to build roads that will withstand tropical conditions and carry heavy vehicles. Such equipment may include tractors capable of traversing boggy and swampy terrain, bulldozers for roadbuilding and for preparing positions, and, in some cases, boats for crossing rivers and flooded swamps and for displacing long shorelines and rivers. Other considerations are as follows:

(1) Aerial reconnaissance is a necessity in route selection. Aerial photographs effectively supplement maps and map reconnaissance. In addition, helicopterborne scouting parties may be used to advantage in route reconnaissance.

(2) The use of helicopters materially increases the mobility and flexibility of the artillery in jungle operations by providing the batteries with a constant supply of ammunition and the lift capability to move from one firing position to another while bypassing impenetrable areas. See Section X, Airmobile Artillery Operations.

b. The rate of march depends on the type of jungle terrain, the availability of trails, the transportation means employed, and the formations and security elements employed. If a dismounted march is required, march distance, obstacles, and the physical condition of troops are considered in calculating the rate of march. The rate of march, the distance of march, and the

number of rest periods are commensurate with the physical endurance of the men. Extreme temperatures make frequent halts necessary. During mounted marches, the rate of march, the march distance, the type of security formation, and the fire support available are the major factors considered.

c. Standard march security measures are applicable to jungle movements. However, distances between march elements are reduced and other security measures are intensified because of the reduced visibility and the natural obstacles. When a unit is operating independently, all-round security is necessary.

(1) Point security elements may proceed ahead of the advancing main column to reconnoiter all possible danger areas. Elements should include combat engineer teams.

(2) Flank security is a continuing requirement. During a mounted march, the only flank security available may be that of individuals with assigned weapons in the vehicles, aerial fire support, or fire support available to an airborne air observer assigned to assist the march element. When foot marches are required, flank security elements may have to cut their own trails and will experience difficulty in keeping abreast of the march column. In these cases, they are rotated frequently, thus reducing the speed of the column. When crossing danger areas, flank security elements may be employed to cover the crossing. If used, these elements rejoin their march units as soon as possible after the crossing is completed.

(3) Supporting weapons are kept well forward in the column so that, when contact is made, their full firepower can be quickly brought to bear on the enemy.

(4) During extended halts and, when possible, during short halts, units move off the roadway and/or trails and form a hasty perimeter. Security elements are posted in all directions. At least 50 percent of the unit is placed on alert. Halts for overnight bivouacs are made sufficiently early to permit adequate security of the bivouac area before darkness.

(5) Preplanned on-call fires for execution by other artillery may be developed for specific target areas along the route of march. These are used in the event the column is attacked while marching.

d. Vehicle maintenance requirements increase because of the effects of humidity, precipitation, and high temperatures. These conditions cause an excessive number of spring failures, overheated

engines, electrical and fuel system failures, and cause rotting of canvas and corrosion of metal items.

7-27. Observation

a. Observation is restricted by jungle growth and is often limited to the immediate vicinity of the observer. Usually, the canopy in a primary rain forest, which consists of a virgin growth of mature trees, is so thick that it cuts off most sunlight and reduces visibility to 20 to 30 yards. Visibility may be limited to 5 yards or less in a secondary forest, which is composed of a growth that develops when the original forest has been burned off or cut. Rain clouds, and the steamy exudation from wet areas also tend to reduce visibility. Because of limited visibility and lack of conspicuous landmarks, it is often difficult to locate a ground position from a map. Forward observers may carry control by several means to include compass, pacing, and artillery resection, in coordination with available observation aircraft, to establish their exact location.

b. Artillery forward observer parties must be large enough to carry the equipment, provide security, and, if practical, lay wire. They must be well forward but in close contact with the supported unit at all times. Since checkpoints and known locations are rare, observers must use initiative in devising methods of spotting fire. If the observer cannot see the burst, he may use the sound spotting method. The observer must know the slope of fall of the projectile and the height of the trees in the vicinity of the target to prevent projectiles from bursting over friendly troops. Often, close-in targets can be engaged only through the use of high-angle fire. Some observation advantage may be gained from high trees and dominating terrain. Also, aerial observation from Army aircraft is effective in locating hard targets, such as enemy batteries, troop concentrations, bivouacs, and boats.

c. Army aircraft can be profitably utilized in jungle warfare in adjusting fires, locating friendly lines and enemy bivouac sites, spotting targets for airstrikes, delivering supplies to forward units, and acting as relay or control stations in artillery radio nets. Observers in aircraft can work as a team with ground observers in adjusting artillery fires. Although the ground observer can hear the rounds detonate, he often cannot see the bursts, even though he can see the target; the air observer can see the bursts but may know only the approximate location of the

target. A combination of their spottings (both visual and by sound) gives the fire direction center a better picture of the adjustment and speeds up the delivery of effective fire.

d. Patrols are often an excellent source of target information.

e. Smoke and white phosphorus ammunition are often used to mark targets for airstrikes and to assist in observation during artillery adjustment.

f. The employment of surface target acquisition devices is generally restricted by tree canopy, lack of survey control, poor trails for moving heavy equipment, and the necessity for cleared fields of scan for the radar sets. When they can be installed, sound and flash ranging bases and radars can operate efficiently, though their range may be reduced.

7-28. Positions

Jungle vegetation makes the preparation of positions difficult because the required fields of fire for artillery weapons must be hacked out of the jungle and usually require a 6400 mil firing capability. In some cases, positions along streams, on beaches, or on adjacent islands may provide suitable fields of fire. Since natural fields of fire are generally limited to 5 or 10 meters and undergrowth is generally heavy, several days of labor may be required to clear 100-meter fire lanes around positions. This work is expedited by employing supporting engineers with portable power cutting tools and/or herbicides and defoliants. Care must be taken, in clearing fields of fire, to disturb the tree pattern as little as possible to avoid disclosure of the position to enemy aircraft. When possible, artillery batteries occupy positions near roads or trails. In wet weather, roads into positions should be corduroyed and platform built to support each weapon. In some positions it may be necessary to emplace weapons on prefabricated gun (firing) platforms which can be helicopter transported to the site.

a. Artillery units stress position security. Positions are normally more compact in jungle terrain than in open terrain. Positions are constructed to provide a 6,400-mil, all-round fire capability with the weapons placed close together to facilitate control and security. The area is bounded by barbed wire set out beyond hand grenade range and supplemented with boobytraps, trip flares, and sharpened stakes. Lanes of fire for machineguns are cut in the form of tunnels through the jungle and interlock with those of

adjacent machineguns. Combat outposts and/or listening posts are usually required.

b. Within the position, paths or trenches should be cut to connect each howitzer section with other battery installations and with foxholes and/or fighting bunkers with firing posts, which can be occupied to support the perimeter defense. Wire entanglements are placed around each howitzer section to prevent close-in grenade and bayonet charges and to preclude an enemy force from moving simultaneous and directly to all weapons. All personnel have foxholes prepared and readily accessible. At least two men are alert at each howitzer at all times.

c. When the mission permits, the direct support artillery should be located within the area of the infantry reserve to take advantage of the protection provided by the riflemen. The batteries of a cannon battalion should be within artillery range of each other to insure mutual protection and to retain the ability to mass fires on a common target. After each battery has established a perimeter defense, the defense system must be integrated into a battalion defense plan. Security must be stressed when displacing to new positions, since the jungle aids the enemy in preparing an ambush. The march security precautions discussed in chapter 9, FM 6-140 apply.

7-29. Fire Capabilities and Limitations

a. As in mountain operations, the delivery of accurate massed fires in jungle operations is difficult and the flexibility of artillery fire is reduced by high masks, scarcity of suitable positions areas, lack of accurate maps and survey control, and restricted observation. Direct fire missions may be required to defend positions against ground attack. Heavy and medium cannon artillery may be used in a direct fire role to destroy caves and pillbox emplacements. Light artillery may be used in the indirect fire role to defoliate trees and destroy natural camouflage to expose hidden emplacements. High-angle fire may often be used to clear tall masks surrounding positions. Caution is exercised when adjusting all fires to insure that friendly troops are not injured by tree bursts.

b. Fire support and maneuver are interdependent; their planning and execution are more difficult in the jungle and must be closely coordinated. The procedures to accomplish the tasks involved in the coordination of fire support will vary with the headquarters, the volume and type of fire support available, and the type of operation.

(1) Long-range fires, close-in defensive fires, and fires within the position are planned and executed as in normal terrain.

(2) The proximity of units in jungle operations calls for extensive and detailed planning of final protective fires (FPF).

(3) The control of fires of the infantry's organic weapons is decentralized to the extent required by the frontage of the unit, the terrain, and the limits of the higher commander's observation.

(4) Units whose defense areas are not under attack or whose fires are not required to support the area under attack may hold their fires so that their positions will not be revealed.

(5) The effects of jungle terrain on the efficiency of supporting weapons are always considered when planning for fire support.

c. The observer often adjusts fire on close-in targets by sensing the location of the burst through sound and then using the creeping method. When this method of adjustment is used, extra caution must be taken by both the observer and the fire direction personnel to guarantee accuracy. Observers with adjacent units can assist in the adjustment by giving their sound sensings.

d. Problems in control and communications often make decentralized control of artillery unavoidable. As a result, batteries may be employed independently. In such situations, a more thorough reconnaissance is necessary in locating future positions and closer liaison is required with the supported unit. Jungle fighting erupts suddenly, and quick reaction of the artillery is essential. During marches, a single piece near the head of the column may place direct fire on enemy roadblocks, tanks, or bunkers. Light artillery is generally more appropriate for jungle warfare than medium and heavy artillery because of the ease in handling and transporting. However, towed medium artillery, which is transportable by helicopter, and heavy artillery are invaluable for their long-range capability and heavy volume of fires.

e. Under weather conditions normal to tropical areas, meteorological data is generally not subject to rapid change; therefore, meteorological corrections are reasonably accurate.

7-30. Ammunition

a. Supply and storage of ammunition is a serious problem in the jungle. Since many missions are fired close to friendly troops, sorting of ammunition must be carefully supervised to insure

uniform lots. Ammunition must be stored with care to protect it from moisture, since exposed powder charges and metal surfaces deteriorate rapidly in the jungle humidity.

b. High-explosive (HE) shells are effective in the jungle. The choice of fuzes for HE shells is influenced by the nature of the vegetation. APERS (beehive) may be employed in a direct fire role in defense of the battery area. Smoke shells are used extensively in adjustment, because their bursts can be easily identified, and are useful in marking targets for airstrikes and for producing smoke screens. Chemical shells are effective in producing casualties among personnel in prepared positions and emplacements that are relatively invulnerable to other shells. A longer target exposure time results from low windspeeds and stable meteorological conditions under jungle canopy. For information concerning nuclear weapons effects in forests, see the FM 101-31-series manuals, the FM 3-10-series manuals contain information concerning chemical weapons effects.

c. Fuze quick is effective in areas of low tree canopy; it provides tree bursts at a desirable height and produces a bonus effect of splintering. VT and time fuzes are generally ineffective in heavy tree canopies; the rounds are difficult to adjust and much of the fragmentation effect is dissipated in the canopy. The performance of VT fuzes may be erratic because of excessive moisture.

7-31. Communications

a. Although radio communication in the jungle is highly desirable, especially in the attack, it is seriously affected by line-of-sight restrictions, dense vegetation, and adverse atmospheric conditions, resulting in a 40- to 70-percent decrease in the range considered normal in open or lightly wooded terrain. Radio operators are trained to copy weak signals and to use expedients in constructing and siting antennas. Remote control equipment may help in securing more favorable locations for radio sets. Aircraft can assist ground communications by acting as radio relay stations and making terrain surveys for radio relay sites. Helicopters can be used to transport personnel and equipment to selected sites, thus expediting the speedy installation of important circuits. Aircraft may also be used to supply operating communication personnel with rations, POL, and parts.

b. The limitations imposed by the jungle on

other means of communication place greater emphasis on wire. Ground wire routes are limited, and the few available routes are normally heavily traveled, making overhead construction desirable. Helicopters may be used to lay wire rapidly over jungle canopies. In a fast-moving situation, it may be difficult to maintain wire communication and the vulnerability of wire lines to enemy sabotage and/or tapping for intelligence purposes increases.

c. Visual communications include the transmission of messages by flags, panels, and pyrotechnics. The use of visual communications is limited by the density of the jungle and the scarcity of areas suitable for their use.

d. Before the commencement of jungle operations, every possible measure is taken to dry out and protect equipment. The care of communication equipment is of special importance in the rainy season. It must be protected against fungus growth, insects, corrosion, and moisture. A treatment which can be used in the field consists of spraying or brushing on a moisture- and fungus-resistant varnish. The varnish should be applied prior to receipt of the equipment by the user or prior to issue of the equipment for use in the jungle. Additional protection consists of waterproof covers, either issued or made from salvage material, and keeping the equipment off damp or wet ground.

7-32. Survey

a. Since adequate maps do not exist for most jungle areas, survey control should be established when feasible. Survey through jungle growth is a time-consuming and difficult operation. Though few survey control points may be available, survey control can usually be extended to individual forward observer and battery positions. Target area survey is usually restricted. Since line of sight (required for triangulation, resection, and trilateration techniques) is usually extremely short or nonexistent, traverse is generally the survey technique used.

b. When the tactical situation precludes the use of standard survey techniques (traverse, triangulation, astronomic observation, or gyro azimuth surveying instrument techniques), survey control may be extended by using one or a combination of the following: radars, helicopters, and aerial photographs and photomaps (FM 6-2). Frequently, it is necessary to establish initial control by map-spotting and directional control by astronomic observation or by use of a gyro azimuth

surveying instrument. However, the use of counter-mortar radars to determine horizontal control and simultaneous observation to extend directional control is usually more accurate than map-spotting.

7-33. Logistics

a. Logistic problems of the artillery in jungle operations develop from the rapid deterioration of all classes of supplies, the difficulty in movement and in keeping supply and distribution points close to elements on the move, and the increased need for preventive medicine. Supply economy on the part of each individual is rigidly enforced. Security of logistic installations is a continuing requirement, since jungle conditions are conducive to infiltration, guerrilla action, and raids.

b. Logistic requirements must be anticipated well in advance of actual needs, and provisions must be made for adequate storage of supplies and for issuing supplies to the user. Control of all classes of supplies must be closely supervised in order to exclude surplus and nonessential items. For maximum efficiency, all modes of transport should be used. Air transportation is an important means of supplying jungle operations. Emergency supplies can be airlifted when all other means of transport fail.

c. Although all equipment for use in the tropics must be capable of functioning efficiently in high temperatures, temperatures alone do not cause the greatest difficulties. Storage and supply problems of all items are compounded by the combined effects of jungle conditions.

Section VI. DESERT OPERATIONS

7-34. General

Artillery techniques must be modified for operations in desert regions. Desert terrain varies widely from low, flat, sandy plains to high, rocky mountainous areas. Temperatures vary from torrid to subzero according to the latitude and altitude. Characteristics that are common to all desert regions are arid climate and a lack of vegetation. The principal problems confronting artillery engaged in desert warfare (FM 31-25) are observation and maintenance.

7-35. Observation

a. Ground observation of artillery fires in hot, flat, sandy desert areas is very difficult because of heat waves, mirages, lack of elevated positions, and frequent duststorms. Distances observed over

flat terrain are deceiving and are usually underestimated. The absence of identifiable landmarks reduces the value of maps. Aerial observation, although more effective than ground observation, is also hampered by these factors.

b. Observation in mountainous desert areas is subject to the limitations discussed in section IV, Mountain Operations.

7-36. Maintenance

Because of the frequent duststorms and sandstorms, continuous intensive maintenance is required to protect all material from the abrasive action of fine dust and sand. Wear on cannon tubes, slides, and all bearing surfaces and scouring and pitting of optical instruments are greatly increased in desert regions.

Section VII. COMBAT IN BUILT-UP AREAS

7-37. General

a. Most built-up areas can be bypassed without materially affecting the commander's plan of maneuver. Only built-up areas that occupy key terrain or that constitute islands of resistance so large as to be serious threats to future operations normally are attacked. Outlying areas which afford good fields of fire become the enemy's first line of defense. This line may be fortified with anything from hastily prepared positions to mutually supporting concrete emplacements. If the initial line of defense is penetrated, the defender

must fall back to the town. The attack of the built-up areas is divided into the following three phases:

- (1) Isolating the built-up area.
- (2) Penetrating the defender's initial line of defense.
- (3) Advancing through the built-up area.

b. FM 31-50 contains a detailed discussion of the phases of combat in fortified areas and towns.

7-38. Artillery Support of the Attack

a. After the built-up area is isolated, the artil-

lery commander prepares to support the two remaining phases of the attack. In the second phase, which is to penetrate the defender's initial line of defense, control of the artillery is centralized. The mission of the artillery in the second phase is to destroy fortifications, neutralize enemy artillery, and provide interdiction fires. The forces holding the built-up area will normally have good observation, thus forcing friendly troops to displace at night or along concealed routes. With the successful completion of the second phase, the artillery displaces quickly to support the third phase of the attack.

b. The third phase of the attack, which is advance through the built-up area, is characterized by semi-independent action of small units, which attack through separate corridors of the built-up area. Control of artillery in the third phase is frequently decentralized to provide support to the attacking units. Observation is usually poor, and the artillery must depend almost entirely on forward observers for conduct of fire. Communication with forward observers is impaired by buildings that interfere with the line-of-sight characteristics of artillery FM radios. Artillery delivering direct fire should be self-propelled and should have sufficient firepower to destroy designated buildings. Artillery providing close support to attacking troops must be capable of high-angle fire. If opposing forces are close together, it may be necessary to withdraw the attacking forces while artillery is being fired. The greater part of indirect fires will be adjusted fires to insure safety.

c. A built-up area that has been attacked with

nuclear weapons may become a formidable obstacle and may provide an excellent defensive area; consideration should be given to the use of chemical weapons if destruction of buildings is not desired. The plan for employment of nuclear weapons against a town should provide for a relatively clear passage through some portion of the town; this portion should be attacked with chemical fires producing negligible contamination. The enemy must be prevented from reoccupying the town after it has been attacked with nuclear weapons; chemical fires producing significant contamination may be considered in this role. For further information concerning nuclear weapons effects against built-up areas, see the FM 101-31-series manuals; the FM 3-10-series manuals contain information concerning chemical weapons effects.

7-39. Artillery Support of the Defense

In the defense of towns or built-up areas, artillery is so emplaced that it can fire against any attempted envelopment of the town or against hostile forces (within range) that are attempting to bypass the town. The supporting artillery must be able to deliver the preponderance of its firepower on the critical avenues of approach and to fire final protective fires on close-in approaches, such as streets, open areas, and areas containing lightly constructed buildings. If the enemy makes a penetration, the artillery must be able to deliver the preponderance of its firepower against the penetration and to support the counterattack.

Section VIII. RIVER CROSSINGS

7-40. General

Wide, unfordable rivers have considerable influence on military operations because they impose restrictions on movement and maneuver. They constitute obstacles to attack and afford natural lines of resistance for defense. For details of river-crossing operations, see FM 31-60.

7-41. Artillery Support of the Crossing

a. The crossing is supported from positions as far forward as secrecy permits. These positions are occupied under cover of darkness or during periods of low visibility at the latest possible time prior to the attack. When the defender has the capability of employing nuclear weapons, the attacker must avoid forming large vulnerable targets on either side of the river. Movements

from rear assembly areas are continuous through the crossing sites.

b. General support and reinforcing field artillery units must be prepared to provide close support for the assaulting troops during the displacement of direct support artillery units.

c. The major part of the artillery crosses the river when it is determined that continuous effective support can be provided from the new positions.

d. Fire support planning must be detailed and coordinated at all echelons. Centralized control of artillery is maintained when possible to provide fire when and where needed. When crossings are made on a front too broad to permit centralized control of artillery during the crossing, centralized control is regained as early as practicable

after the crossing. When necessary, targets for nuclear weapons or the use of smoke may be selected to insure a successful crossing rather than to inflict maximum initial damage on the enemy. Properly employed, nuclear weapons or smoke operations may eliminate effective small-arms fire on the crossing sites; they may also eliminate effective artillery fire on the crossing sites by destroying or neutralizing the enemy artillery or its observation capabilities. Chemical fires producing negligible contamination may be used at the actual crossing sites, whereas chemical weapons producing significant contamination may be used to isolate the defending forces or restrict their movement. Consideration should be given to maintaining a reserve of nuclear weapons for employment against the mobile counterattacking forces of the defender after the assault crossing. The use of air-transported troops to lend flexibility and speed to crossing operations requires close and detailed coordination of supporting fires.

e. When nuclear weapons are employed, initial objectives are normally deeper than when only nonnuclear weapons are employed. These objectives, which may include objectives for airborne assault, are selected to isolate the defending forces, destroy them in place with nuclear weapons and offensive maneuver, or force them out of position. Rapid exploitation follows the assault across the river obstacle.

f. Prior to, during, or immediately after the crossing, artillery may be required to—

- (1) Furnish illumination either with searchlights or illumination shells.
- (2) Smoke enemy observation.
- (3) Screen movement and crossing noises of the attacking force by fire.
- (4) Support feints and demonstrations.

Section IX. STABILITY OPERATIONS

7-43. General

a. Artillery is extremely effective in supporting all aspects of internal defense and development campaigns in stability operations. Its mere presence in an area discourages movement in restricted zones and in other areas covered by artillery. Additionally, knowledge that fire support is available to augment hamlet defense forces is encouraging to the civilian populace.

b. The mobility, disposition, and tactics of insurgent forces are such that targets are difficult to locate and engage. Ammunition expenditures may be larger with lesser results when compared

7-42. Artillery Support of a Defense at a River Line

a. A river obstacle favors the mobile defense. The organization for defense depends on the terrain, enemy situation, and forces available and the nuclear and air situation. Artillery is employed to cover all probable crossing sites. It is deployed in depth so that it can mass fires on critical points in the enemy's rear. Elements of the artillery may be positioned on the far shore in support of security forces. Coordination between the artillery and the security forces is essential to insure the withdrawal of the artillery with the security forces. Emphasis is placed on fires which assist in canalizing the enemy and which stall his attack astride the river and destroy him by fire and counterattack. When the enemy's main crossing is disclosed, artillery must be prepared to support the counterattack with the bulk of its fires. Emphasis is placed on maintenance of probable routes of displacement and on preparation of fire plans and supplementary positions to support all counterattack plans.

b. When the number of suitable crossing sites available to the enemy is limited, the planning for nuclear and chemical fire support include provisions for the disruption of the approaches to the crossing sites on either or both sides of the river, depending on the defensive maneuver plan. A target analysis is made of the area within the defensive position for the possible elimination of enemy airheads and bridgeheads by use of nuclear and chemical fires. Nuclear and chemical fires against the enemy on the friendly side of the river are exploited by mobile reserves. Nuclear and chemical fires on the enemy side of the river are exploited with other fire support resources.

with those in conventional warfare. Prearranged fires designed to impede enemy movement across defensive lines or areas and night illumination missions for outpost and village defense have proved invaluable. The demoralizing effect of artillery fire on insurgents often justifies its use even though there is little possibility of inflicting material damage. Artillery, with its quick-reaction times and capability of shifting fires over wide areas, is a responsive and effective means of countering insurgent actions. The delivery of timely and effective artillery fire in response to insurgent activity often discourages further activity within known artillery range.

7-44. Phases of Insurgent Activity

The degree of participation by U.S. Army artillery units is related to the level of insurgent activity. The following phases of insurgent activity describe the levels of intensity of insurgency:

a. Phase I. Phase I ranges from circumstances in which subversive activity is a potential threat, latent or incipient, to situations in which subversive incidents and activities occur with frequency in an organized pattern. It involves no major outbreak of violence or uncontrolled insurgent activity (JCS Pub 1). *Subversion* is the major activity, and generally there are no insurgent tactical forces conducting field operations.

b. Phase II. Phase II is reached when the subversive movement, having gained sufficient local or external support, initiates organized *guerrilla warfare* or related forms of violence against the established authority (JCS Pub 1). Important factors of this phase are that, in guerrilla warfare, combat operations are conducted in government-controlled territory by relatively small groups using tactics characterized by elusiveness, surprise, and brief violent action for the purpose of absorbing and diverting government resources and creating an atmosphere of confusion and uncertainty. Insurgent tactical forces begin guerrilla warfare operations while subversion continues. The insurgent objectives in this phase are to isolate the rural areas from government influence, conduct political warfare, and prepare base areas for anticipated phase III operations.

c. Phase III. The situation moves from phase II to phase III when the insurgency becomes primarily a *war of movement* (mobile warfare) between organized forces of the insurgents and those of the established authority (JCS Pub 1). Organized insurgent forces are forces which are capable of developing combat power similar in magnitude to that of opposing armed forces elements. The war of movement is initiated while both guerrilla warfare and subversion continue.

7-45. Types of Warfare Engaged in by Insurgents

The types of warfare engaged in by insurgents are classified according to the type of forces usually engaged in the activity and the tactics employed by those forces.

a. Guerrilla Warfare. Guerrilla warfare is conducted predominantly by insurgent irregular and paramilitary organizations in phases II and III of insurgency. Guerrilla warfare comprises sus-

tained combat operations, conducted and supported within hostile territories, in which tactics characterized by surprise, brief violent action, and elusiveness are employed. These operations also may be supported in varying degrees by external sources. Armed forces may conduct guerrilla warfare either as a primary mission or to reinforce paramilitary or irregular forces. Any type of force may be a guerrilla force when it conducts guerrilla warfare. A guerrilla is a combat participant in guerrilla warfare (AR 310-25).

b. War of Movement. War of movement is conducted predominantly by sophisticated paramilitary or armed forces in phase III insurgency. War of movement comprises movement in which the opposing sides seek to seize and hold the *initiative* by use of maneuver, organization of fire, and terrain. Units are prepared to defend objectives deliberately for longer periods than in guerrilla warfare. They attack, in battalion or larger size forces, military units of similar size; however, there are no frontlines or rear areas, and the battlefield is not organized as in limited and general positional warfare. Positional warfare comprises those operations in which the opposing forces seek to seize and hold *terrain* permanently by use of maneuver and organization of fire and retention of the initiative. This type of warfare normally is associated with limited and general war but may be conducted in the latter stages of an insurgency.

7-46. Employment of Field Artillery

a. Artillery units also conduct low-intensity warfare. Low-intensity warfare consists of operations in support of indigenous or allied forces engaged in establishing, regaining, or maintaining control of land areas threatened by guerrilla action, revolution, subversion, or other tactics aimed at internal seizure of power. Field artillery tactical missions in stability operations are the same as in limited or general war. Additional missions which may be assigned artillery units in stability operations include internal security operations (para 7-48), intelligence operations (para 7-49), military civic action community relations programs (para 7-50), psychological operations (para 7-51), and advisory assistance (para 7-52).

b. In the planning of stability operations, the capabilities and limitations of field artillery must be considered.

(1) *Capabilities.* The capabilities of field artillery in stability operations include the ability to—

(a) Deliver fire in all conditions of weather and terrain.

(b) Provide effective fire support day or night.

(c) Engage a target with accurate fire without warning.

(d) Deliver and shift massed fire rapidly within a large area.

(e) Provide a psychological effect.

(f) Conduct demonstrations for show of force.

(2) *Limitations.* The limitations of field artillery in stability operations include—

(a) Difficulty in identifying the insurgent.

(b) Large areas of responsibility often requiring the employment of aerial observers.

(c) Lack of survey control. Survey data, in the form of trig lists and bench marks, may be nonexistent or unusable. Use of the observed firing chart and, when time is available, the high-burst registration may be normal.

(d) The necessity for movement of artillery weapons over poorly developed road networks, by water, by packmule, and, often, by hand.

(e) A requirement for extensive fire planning in order to have preplanned targets on call to neutralize, block, and canalize fleeting targets.

(f) Political restrictions on the use of artillery fire.

c. The use of field artillery may be limited because of friendly communities, activities, and movements within the area of operations.

d. Depending on the situation, artillery battalions in support of, or attached to, a brigade may be deployed by battery, platoon, or section in support of subordinate maneuver units engaged in widely separated stability operations. Artillery employed in battery and smaller size units must usually be augmented and provided additional security forces by the force commander. Artillery units may be assigned any of the four standard tactical missions (see chap 3, FM 6-20-1).

e. The wide dispersion of artillery and the difficulty of surface movement in stability operations have a significant impact on the employment of artillery. Except in the most firmly consolidated areas, artillery units are subject to coordinated attacks, raids, and ambushes and must be collocated with other forces, such as infantry, civil police, and paramilitary forces, and

be prepared to deliver direct fire in position defense. The problems associated with maintenance, supply, and other logistical activities are increased. Methods must be devised to compensate for the effects of wide dispersion and the omnipresent insurgent threat.

7-47. Tactical Operations

a. One of the primary differences between the employment of artillery in limited and general war and in stability operations is the requirement in stability operations to limit casualties among the civilian populace and damage to the material resources of the country. Consideration may be given to integration of tactical CS munitions into the unit's planning for fire support. Indiscriminate application of artillery fires in populated areas may turn the populace away from the government and toward the insurgent movement. The support of the populace is the key to success.

b. Artillery in position or being displaced, associated combat service support installations, survey and forward observer parties, and command and control facilities constantly are subject to insurgent attack. Artillerymen must be prepared at all times to defend their positions. As many activities as possible should be collocated for security.

7-48. Internal Security Operations

a. In addition to supporting unit tactical operations in strike campaigns, artillery must be prepared to assume territorial fire support responsibilities. This role is particularly pertinent in consolidated areas and areas undergoing consolidation. In such areas, the police may have assumed responsibility for the internal security of the hamlets and of certain consolidated areas between the hamlets. Small insurgent parties still may be operating in the area. Artillery may assist the civilian police in enforcing a population control measure, such as a curfew. High-explosive ammunition may be used to insure that the populace stays within limits, and illumination rounds may be used to provide light to assist in the security of the area.

b. The territorial security requirement may require that, for long periods of time, artillery be fragmented and employed down to section level. The requirement to cover an entire political area with fire from dispersed artillery pieces must be balanced with the requirement to mass fires against insurgent formations. Artillery employed in territorial security must cooperate and be able

to communicate with host country police and local political functionaries in order to provide effective fire support to hamlets and along lines of communication.

c. Civilian police and paramilitary forces, together with artillery troops, may be integral portions of a single, coordinated defense position in which the artillery unit is located. Artillery troops and units must be able to participate in internal security operations in and around firing positions.

7-49. Intelligence Operations

a. Artillery units in internal defense and development situations are more involved in producing intelligence than they are in limited and general war. This is particularly true of territorial security artillery, which characteristically is scattered among many population centers within the supported political subdivision.

b. Artillery units employed in territorial security are in proximity to both the civilian populace and the insurgent forces. No frontlines separate the artillery from direct contact with the enemy, as in limited and general war; therefore, artillery battery personnel are key intelligence collection agents. Close contact with civilian police in conducting combined internal security operations enhances the scope and depth of intelligence available. Selected personnel from platoons and sections may be cross-trained in intelligence activities to enable these units to exploit their intelligence collection capabilities when deployed independently. Artillery may be tasked to conduct reconnaissance by fire and to provide cover and deception.

c. Counterintelligence efforts must be emphasized to prevent sabotage and compromise of artillery personnel, materiel, and information. This problem is particularly acute for small dispersed units.

7-50. Military Civic Action

Artillery units contain personnel with specialized skills developed through artillery training and various types of specialized equipment which may be used profitably in military civic action; however, imagination must be given free play to cope with nontraditional situations. Some of the artillery skills and equipment available to assist in national development through military civic action are discussed in *a* through *d* below.

a. The communications facility organic to U.S. artillery units may be used to augment the exist-

ing communications system or to provide a temporary communications system for civil use in remote areas. Artillery units can furnish wiremen, switchboard operators, and telephone operators with necessary equipment and installation and repair capabilities to augment civilian facilities, particularly within the perimeters of consolidated areas. Technicians are available who are capable of installing, operating, repairing, and supervising radio and radio teletypewriter communications media.

b. The unit survey crew, with additional training, can assist military civic action projects by surveying for unsophisticated roadways, bridges, building sites, airstrips, and other installations.

c. Transportation available in artillery units can be used to assist the local government and the civilian populace. Although the number of mechanics within an artillery unit is limited, some instruction and supervision can be offered to host country personnel.

d. Administrative assistance can be provided the local government from organic sources, although this capability is limited.

7-51. Psychological Operations

The psychological impact of artillery in support of stability operations probably will be out of proportion to the damage the artillery fire will inflict. Constant harassing fires directed against insurgent safe havens may cause the insurgents to keep moving and thus induce serious morale problems. Timely and accurate artillery fire delivered on an insurgent force is both devastating to the insurgent force and reassuring to U.S. and host country forces. Illumination is advantageous to friendly forces and the civil populace and disadvantageous to the insurgents. Demonstrations showing the effectiveness and responsiveness of artillery are conducted for their psychological effect. Care must be exercised to minimize the adverse psychological effect of artillery fire through psychological operations, military civic action, and the restrained, selective employment of artillery fire.

7-52. Advisory Assistance

a. Artillery units may provide advisory assistance to host country and allied artillery forces. Mobile training teams may be dispatched from artillery units organic to U.S. Army organizations stationed in CONUS or in unified commands and from artillery units operating in the host

country. Advisory assistance may be provided on an informal basis by in-country U.S. artillery units. The primary objective of artillery advisory assistance is to enable the assisted forces to develop their capabilities to operate effectively in the insurgency environment. Advisory assistance may include artillery specialist training, artillery tactical operations, intelligence operations, military civic action, and psychological operations. In addition, branch immaterial training assistance and new equipment orientation may be rendered to counterpart units. To meet the requirement for forward observers at the many hamlets within the area of operations, U.S. artillery units may train selected elements of the civil populace, police, and paramilitary forces in forward observer procedures.

b. Personnel assigned as advisers to host country artillery units must understand artillery capabilities in general and specific techniques that are peculiar to the use of artillery in stability operations. Areas requiring special attention in stability operations are weapon characteristics, ammunition, mobility, calls for fire, patrol support, harassing and interdiction fires, selection and preparation of positions, and coordination of fires.

(1) *Mobility.* In addition to the normal artillery prime movers, other means of transport may be used. The adviser must use imagination and ingenuity when normal prime movers are unavailable or when their use is impracticable.

(a) *Boats.* Operations conducted in large inundated areas or areas bisected by navigable streams and rivers can be supported by artillery through the use of boats as prime movers. The landing craft, vehicle, personnel (LCVP), can transport artillery up to and including the 105-mm howitzer. The howitzer should be loaded muzzle first in order to facilitate unloading. In most cases, the crew will be able to manhandle the weapon into and out of the boat, using the handbrakes for control. If it is necessary to beach the craft on a steep bank, the weapon may have to be extracted by means of a block and tackle or winch.

(b) *Helicopters.* The 4.2-inch mortar and towed artillery weapons up to and including the 155-mm howitzer can be lifted by helicopter. Helicopter transport permits the use of artillery in almost any operation where terrain and the enemy situation are deterrents to normal ground mobility. Depending on the type of helicopter used, it may be necessary to disassemble the how-

itzer into several loads. Whenever possible, reconnaissance for positions should be conducted. Ammunition resupply should have priority when helicopters are used for artillery transport.

(c) *Armored personnel carriers.* The 4.2-inch mortar can be internally transported in the M113 or M59 armored personnel carrier. In marshy, inundated areas, the personnel carrier affords an excellent means of positioning artillery.

(2) *Calls for fire.* A simple method by which defenders can call for artillery fire should be devised. The method must be easily understood by villagers, and the call for fire must be easy to transmit over the local friendly communications system. An example of an aid that can be used to assist relatively untrained paramilitary personnel in calling for artillery fire in the event their post or hamlet is attacked by guerrilla forces is a round board divided into quadrants with each quadrant painted a different color. The first quadrant may be red; the second quadrant, white; the third quadrant, blue; and the fourth quadrant, yellow. The board is permanently mounted in the village and is oriented on a north-south line. Defenders can call for fire by using a color to indicate direction. This method requires close coordination with artillery units and as many preplanned targets as possible. Another example is the target indicator (fig. 7-1). The target indicator is located permanently where there is good observation and is oriented by grid azimuth. On it are depicted preplanned targets and prominent terrain features. When under attack, the defenders position the movable arrow in the direction(s) of attack and call for fire, using either a polar plot or the preplanned target nearest the enemy force. The amount of detail depicted on the target indicator can vary, but too much detail should be avoided to minimize confusion. The distances to terrain features can be shown to enable the defenders to give a more accurate polar plot. An artilleryman from the supporting artillery unit should orient the target indicator in the post or hamlet and instruct defenders on its use. As many potentially capable individuals as possible should be trained in its use. Check rounds should be fired periodically on the planned targets, especially those in close proximity to the post or hamlet, to insure accurate fire in the event of attack. More sophisticated methods can be devised, depending on the time allowed for training and the receptiveness of trainees to instruction. Any method requires reliable and responsive communications.

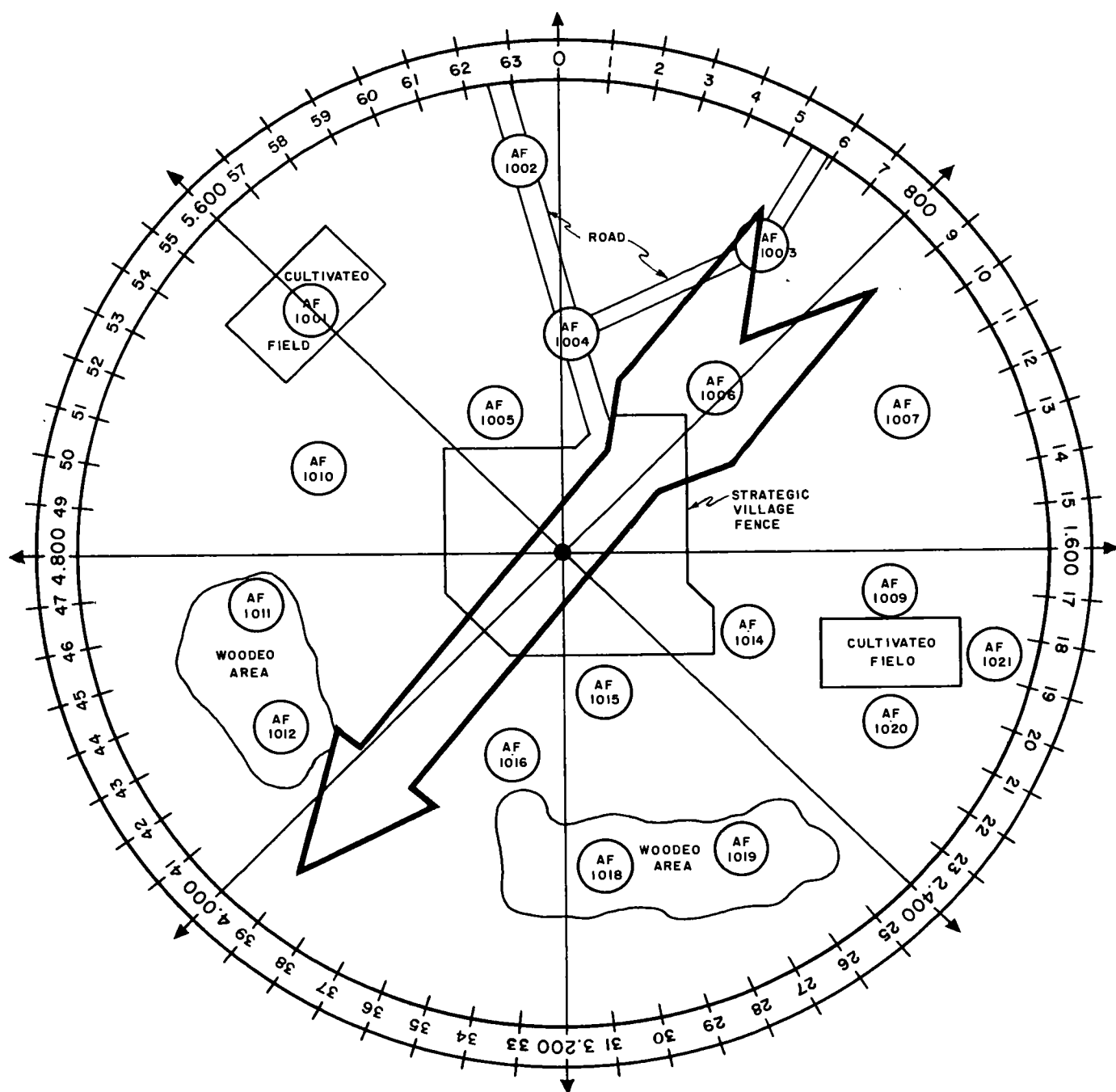


Figure 7-1. Example of type target indicator.

(3) *Patrol support.* Active patrolling in an area where stability operations are being conducted is mandatory. Whenever possible, artillery support of patrols should be provided. The support must be carefully coordinated before the patrol begins. The supported commander must provide the artillery unit such information as the size of the patrol, the times of departure and return, the mission of the patrol, the routes to be used, and any special instructions. Prearranged

fires may be planned on critical areas. As a minimum, the patrol route should be indexed to match prominent or easily identifiable terrain features from which the patrol leader may reference calls for fire.

(4) *Harassing and interdiction fires.* Artillery fire, because of its psychological effect on insurgents, should be utilized to the maximum in the harassing and interdiction (H&I) role. Targets for H&I fires can be obtained from many

sources to include maps of insurgent-controlled areas, informers, and patrol reports. Infantry commanders and district leaders should stress the importance of having patrols locate and record suspected insurgent routes and installations. Patrols should be ordered to record coordinates of deserted camps, villages, or areas which appear to be insurgent training areas. Such locations should be fired on from time to time in order to curb insurgent movement, to deny insurgents use of the areas, and to lower insurgent morale. Targets for H&I fires must be carefully selected in order to insure the safety of local inhabitants.

(5) *Selection and preparation of positions.*

(a) To the maximum extent possible, artillery positions should be selected to afford a 6,400-mil firing capability. Care should be taken not to mask artillery fires when the positions are in or near built-up areas. Although position security is a primary consideration, the ability to perform the mission is the paramount consideration.

(b) Improvement of the position area is continuous. However, improvement should not result in a cannon parapet which precludes the ability to conduct direct fire.

(c) Alternate position areas should be selected throughout the battalion/local friendly area to add flexibility to the employment of artillery. In order to deny the insurgents advance knowledge of the locations of alternate position areas and the opportunity to mine or make plans for ambush, the areas should not be prepared. Artillery should move intermittently to within range of areas in which insurgents feel secure (out of normal artillery range) to keep them off balance and disrupt their activities.

(6) *Coordination and control of fires.*

(a) Coordination between the supported force and the supporting artillery is vital. Artillery may be attached or in direct support of the supported force. As a minimum—

1. Communications are established.
2. Call signs are arranged.
3. Artillery range capabilities are explained to the supported force commander.
4. Forward observers and liaison officers are assigned.
5. Fire planning is accomplished.

(b) Control of fire is the inherent responsibility of the force commander, who delegates authority to control fire to the artillery commander. The artillery commander has knowledge of the scheme of maneuver and the disposition of friendly forces and, by virtue of close liaison with the force commander, is able to render quick decisions on calls for fire. Calls for fire must be answered as quickly as possible. Restrictions imposed by force commanders that unduly delay delivery of artillery fire should be examined and explained to host country counterparts immediately upon discovery in an effort to have such restrictions removed. Firing demonstrations may be conducted to prove the worth of artillery to, and build confidence in, the host country counterparts.

c. When advising a host country counterpart in the planning of an operation that includes artillery, the adviser must insure that the unit assigned the mission is able to accomplish the specific inherent fire support responsibilities of that mission. See chapter 3, FM 6-20-1 for the responsibilities inherent to the standard artillery missions.

Section X. AIRMOBILE ARTILLERY OPERATIONS

7-53. General

a. Airmobile artillery is artillery that is transported by aircraft in a tactical configuration to accomplish the artillery mission without using the aerial prime mover as a firing platform. Airmobile cannon units support elements of the force by providing surface-to-surface fires. Aerial field artillery units support elements of the force by providing air-to-surface fires.

b. This section provides guidance for commanders and staff officers in planning and executing air movements of artillery with helicopters. Application of the guidance can be altered when

fixed-wing aircraft are used. See FM 57-1 and TM 55-450-15 for details of air movement of troops and equipment.

7-54. Concepts of Employment

a. Artillery movements in which aircraft are used as the primary means of transport are conducted as tactical moves and may be executed during daylight or darkness. Air movement of artillery has application in all types of operations and is used to rapidly launch artillery units into battle in support of the maneuver force, to overcome natural and manmade obstacles that would

otherwise prevent occupation of position, to facilitate rapid displacement of artillery units over terrain inaccessible to wheeled and tracked vehicles, to bypass enemy troop concentrations, and to position artillery units to facilitate future operations.

b. Air movement of artillery is characterized by detailed planning and coordination, aggressive execution, speed of displacement, and operation with minimum personnel and equipment for periods of short duration.

c. Air movement of artillery is conducted in four phases—planning, marshaling, movement, and occupation of position. The planning phase consists of coordination with supported and supporting units, fire planning, reconnaissance and selection of positions, preparation and issuance of orders, and rehearsals, when the situation permits. The marshaling phase consists of ground movement to appropriate pickup areas as required; preparation of the helicopter loading areas within the position area; preparation of troops, equipment, and supplies for airmobile operations; and loading of helicopters preparatory to actual movement. The movement phase consists of the actual move from the loading area to the landing site. This phase commences with takeoff of the first helicopter and cases with arrival of the last helicopter load at the landing site. The occupation of position phase consists of the organization of the helicopter landing site by an advance element, unloading of personnel and equipment, and occupation of the position.

d. An artillery battalion in an airmobile operation may be assigned the standard tactical mission of direct support (DS), reinforcing (reinf), general support (GS), or general support-reinforcing (GSR). See chapter 3, FM 6-20-1 for a detailed description of these missions.

e. An artillery battalion is normally placed in direct support of a brigade task force and is employed to cover the entire area of operations of that brigade. The depth of the objective and the mission of the supported force are major factors in the determination of the amount, type, and positioning of artillery to support the operation.

f. The direct support artillery battalion commander or his representative is the fire support coordinator (FSCOORD) for the brigade and is located where he can best coordinate all fire support means available to the brigade task force and insure that fires are planned and delivered in accordance with the plans and needs of the force.

(1) The command post of the direct support artillery battalion is normally collocated with the brigade command post or with one of the howitzer batteries supporting the force.

(2) At least one airmobile howitzer battery is positioned to provide support throughout the zone of a committed combat battalion. Mutual support between artillery batteries is desirable. Batteries may be required to operate independently for a short period of time to support small task forces in an airmobile operation. It may be necessary to augment such batteries with personnel and equipment.

(3) Artillery units must be flexible and capable of moving with extremely short leadtimes in various types of aircraft. Units must establish and rehearse standing operating procedures for air movement.

g. Attack helicopters may be assigned the mission of providing security to transport helicopters in airmobile operations and of delivering fires in the landing zone (LZ) just prior to the arrival of the force. Attack helicopters also provide a means of supplementing and extending the fire support capability of the ground commander.

7-55. Mission Planning

a. *General.* The success of an air movement of artillery depends in great measure on planning. The length and detail of the planning phase depend on the urgency of the situation. Planning is materially enhanced by the development and rehearsal of the SOP and by frequent briefings. Briefings should include information on present and future operations, current sortie requirements, data on weather and terrain, and a review of possible landing zones in the area of operations. The planning phase of the movement begins immediately upon receipt of the warning order and continues through commencement of the movement. In addition to the concept of operation, major considerations involved in planning the movement are command and control; coordination; organization of the unit consistent with the mission; reconnaissance and selection of ground and air routes, loading areas, landing sites, and position area(s); preparation of marshaling and helicopter loading and unloading plans; resupply requirements; and preparation and issuance of the unit operation order. Specific instructions and deviations from the SOP are provided for by fragmentary orders and prearranged messages.

b. *Command and Control.* The relationship be-

tween the aviation commander and the artillery commander is determined by the mission or status (attachment, direct support, general support, or reinforcing) assigned to the aviation unit. If the aviation unit is attached to or placed under the operational control of the artillery, a command relationship is established and control is transferred to the specific commander or headquarters to which the unit is attached. If the aviation unit is assigned a mission of direct support, general support, or reinforcing, a coordination relationship is established and control is retained by the parent unit. If the artillery is allocated helicopters on a mission basis by sorties, the relationship is one of coordination only. A command relationship insures responsiveness to the artillery's needs.

c. Coordination. Liaison coordination relative to the artillery air movement should be conducted on a continuing and aggressive basis throughout all phases of the operation. Normally, a liaison team or a representative from the supporting aviation unit is provided to the artillery unit to assist in the technical aspects of planning and executing an air movement and to supervise rehearsals, preparation and distribution of equipment in the loading area(s), loading and unloading, and signaling relative to the air movement. Continuous liaison must be maintained between the artillery unit and the aviation liaison team or aviation representative in all phases of the movement to include agreement on sortie requirements, radio frequencies, flight routes, armed helicopter escort requirements, desired landing zone characteristics, load configurations, and distribution of equipment for movement.

(1) The unit to be airlifted is responsible for rigging its loads for movement to include providing all slings, ropes, nets, etc. The aircraft crew chief/loadmaster inspects the load for airworthiness. If the load is to be carried internally, the crew chief/loadmaster is responsible for securing the load to the helicopter and provides the necessary means to do so. Cargo straps are organic to the lift company and are carried aboard the aircraft. See the 55-1100-series of technical manuals for detailed rigging guidelines.

(2) Specific areas of responsibility of the supported and supporting units must be specified and made known to all concerned.

d. Organization for movement. Organization of the artillery unit for air movement is an integral part of the planning phase and depends on the type of extraction employed and the type of aircraft available.

(1) The airmobile artillery unit normally displaces in three echelons during air movements. These echelons are designated the assault echelon (air); the resupply, or followup, echelon (air and/or surface); and the rear echelon (surface).

(a) Composition of the assault echelon of a unit varies with the assigned mission, aircraft available, and duration of the operation. The assault echelon consists of the elements of the battery that are essential to control and/or to the delivery of immediate support from the objective area.

(b) The resupply, or followup, echelon consists of the combat support personnel, supplies, and equipment necessary to sustain the assault echelon until linkup or extraction occurs. These necessities are transported to the assault echelon by air and/or surface means.

(c) The rear echelon consists of the remainder of the force, which remains in a rear area until termination of the operation or accompanies the ground linkup force. The rear echelon may be charged with the responsibility of insuring that resupply of the assault echelon is accomplished.

(2) In both categories of extraction, extraction to assault and extraction from contact, firing elements in the pickup zone retain the capability of processing and firing missions as long as possible.

(3) The success or failure of an operation may depend on the adequacy of each echelon of the airmobile artillery unit. Therefore, emphasis should be placed on the selection of troops and equipment for each echelon and responsibilities should be assigned to the most essential personnel consistent with requirements imposed by the assigned missions.

e. Reconnaissance.

(1) In airmobile operations, a physical reconnaissance of artillery position areas should be conducted, if possible, during the planning phase. However, physical reconnaissance frequently may be prohibited due to the unavailability of aircraft, the speed of the operation, or a requirement to maintain surprise and security. The commander must be prepared to move his unit with only limited information available. Physical reconnaissance by air, when feasible, is conducted in accordance with established principles. The reconnaissance provides needed information on the new position area to include alternate landing zones, terrain, routes of communication, enemy situation, location of friendly troops, and flight

routes. It may be necessary for the artillery commander to conduct reconnaissance during the assault with elements of the supported force.

(2) The positions selected must permit the unit to accomplish its mission. The versatility of airmobile techniques makes possible the emplacement of artillery in positions previously considered inaccessible. Weapons can be placed on top of a ridge, scattered among tree stumps, lined up along river banks, or emplaced in other positions where there is room for the howitzers and sufficient clearance for helicopter rotor blades. Additional landing area is required for cargo helicopters transporting internal loads. Battery formations are often dictated by the terrain. Individual piece corrections may be necessary to obtain the desired effect in the target area. Other factors affecting the selection of positions are weather and the tactical situation. Desirable characteristics of an airmobile howitzer battery position are—

(a) Dry, well-drained ground. An area within or adjacent to the battery position that can accommodate cargo helicopters, when required, is a consideration.

(b) Terrain which is suitable for defense and which is located within the infantry perimeter (when such location will not interfere with the mission of either unit).

(c) All-round (6,400-mil) firing capability.

(d) Maximum defilade consistent with the accomplishment of the assigned mission.

(e) Proximity to natural obstacles.

(3) The following factors should be considered in selecting helicopter landing zones within or adjacent to artillery positions from maps, air photographs, and physical reconnaissance:

(a) *Size of the landing zone.* Specific dimensions of the area required for landing and maneuvering helicopters vary with the size of the helicopter, the lift formation, the altitude of the area, and the tactical situation. One CH-47 helicopter requires an area approximately 50 meters square.

(b) *Surface conditions.* Surface conditions should be such that the landing area is not obscured by excessive dust when the helicopter begins to hover and does not bog down upon landing. Loose debris that may cause damage to the engine or rotor blades should be removed.

(c) *Ground slope.* Ground slope in the landing zone should not exceed 10° to satisfy a landing requirement of a medium helicopter.

(d) *Navigational aids.* If the landing zone

is not easily identifiable from the air, navigational aids, such as panels, strobe lights, smoke grenades, radios, and radars, should be available to vector aircraft to the desired location.

f. General Considerations.

(1) In an airmobile operation, the primary means of tactical communication is FM radio. Wire communication is normally restricted to installations within the landing zone and to base camps in rear areas. A radio/wire integration (RWI) station may be established as a link to higher headquarters. Reliable communications are essential to the precise timing and execution of airmobile operations.

(2) Pathfinder elements and equipment, organic to specific aviation units, may be used to aid in the terminal guidance and control of helicopters supporting the artillery movement. TOE pathfinders are trained and equipped to establish and operate electronic and visual navigational aids to assist the helicopter crews in locating a designated facility within a landing area; furnish ground-to-air voice radio communication to the helicopters for the purpose of providing information, guidance, and control; reconnoiter for and recommend suitable drop or landing zones; and assist in the assembly of airlanded forces. When TOE pathfinders are not present, terminal guidance must be accomplished by artillery personnel of the moving unit, who use equipment which is available or improvised. A departure airfield control officer (DAFCO) operates in the pickup zone (PZ), and a landing zone aircraft control officer (LACO) operates in the landing zone. These artillery personnel organize their respective areas and maintain contact with the supporting helicopters.

(3) Positioning of loads according to a standard plan reduces the number of air-to-ground transmissions and personnel briefings and the amount of coordination. Loads should be positioned to reduce flight over the battery as much as possible. All equipment should be positioned so that the aircraft can approach into the wind. Wind direction takes precedence over battery overflight.

(4) The DAFCO and LACO, when providing instructions and information to helicopter pilots in flight, should be in a position where they can observe the aircraft, the loads, and/or the ground markers.

(5) Marking devices available to the artillery unit are air-ground recognition panels and vests and smoke grenades. An easily identifiable

point of reference (e.g., a T-marker) should be established as a reference point to vector the aircraft to a specific point in the pickup or landing zone.

(6) Helicopters may be directed to specific loads or locations by radio transmissions. This method, however, is slow and requires many transmissions. A color-code system may be employed instead. Each load, including howitzers, is assigned a color, which is conspicuously displayed on the load. The guide in the landing zone wears an air-ground recognition vest or uses an air-ground recognition panel of the same color as that assigned the load. The pilot is told the color of his load prior to reaching the pickup zone. En route, he notifies the LACO of his load color and proceeds directly to the marked site or to the appropriate guide, who guides him to the position.

(7) Helicopters can be guided to their pickup or release points by a guide on the ground or by the crew chief in the helicopter. The results are the same; only the manner in which the pilot is informed differs. The method to be used should be selected before the move starts.

(a) A ground guide instructs the pilot by hand-and-arm signals. During daylight operations, he wears a colored vest; at night, he uses colored lights or illuminated batons. The reference point used to guide the helicopter is the load or maker.

(b) The crew chief observes the load or the panel marker through the helicopter hook hatch and directs the pilot to the pickup or release point by means of the helicopter intercom. During daylight operations, a panel marker or color-coded load may be used as a load or drop point marking device. At night, colored landing lights are used to mark the load or drop point.

7-56. Marshaling

Marshaling may commence during the planning phase and continue through the movement phase. It includes preparation of the pickup zone and the control of incoming aircraft. With no prior preparation, initial marshaling should begin at least 2 hours prior to the arrival of the first aircraft. The battery should retain its fire capability as long as possible under the existing conditions.

a. *Preparation of the Pickup Zone.* Preparation of the pickup zone includes rigging loads, positioning marking devices, and positioning equipment for rapid pickup. Loads are inspected for completeness and compactness.

(1) A colored marking device is used to

guide the helicopter to the location of the specific load for pickup.

(2) The howitzer is positioned with the tube into the wind. Its accompanying ammunition is placed nearby. Additional ammunition is packed and placed in a central location, normally the resupply point, and is picked up from that location.

(3) Sling loads may be placed anywhere the helicopter can hover for hookup. Tents within 50 to 75 meters of the landing site or along the approach path should be lowered and secured.

b. *Control of Aircraft.*

(1) Prior coordination with the aviation liaison officer will have established the number of helicopters supporting the displacement. Assistance in controlling the helicopters may be obtained from pathfinder elements organic to specific aviation units. In order for the pathfinders to render assistance, close coordination must exist between the DAFCO and the pathfinders.

(2) In the absence of pathfinders, the DAFCO controls the incoming aircraft in the pickup zone. He furnishes the flight with information concerning the enemy situation, wind direction and velocity, surface conditions, and landing direction and clearance. He may furnish the landing site azimuth, field elevation, landing formation, and other information as required.

7-57. Movement

a. Final coordination and briefings are completed prior to liftoff of the advance party helicopter. If the artillery commander is in the forward area, the executive officer briefs the flight leader. The flight leader must know the location of the landing zone, the radio frequency used for the move, the location of artillery firing along the flight route, the call sign of the control party in the landing zone, the order of march, and the number of sorties.

b. The interval between arrival and departure of helicopters will depend on the plan of maneuver, the conditions in the landing zone, and the number of helicopters the landing zone will accommodate. The advance party helicopter for a battery may be followed in as short a time as 5 minutes by the remainder of the battery, or the battery may await the battery commander's order to move forward.

c. Correct timing is essential in order to keep helicopter orbit and ground times to a minimum.

d. During the approach to the landing zone, passengers should orient themselves by observing the landing zone through ports in the helicopters.

Mounting into and dismounting from the helicopters should be as rapid as possible to reduce helicopter ground time.

7-58. The Battery Landing Zone

a. During the planning phase for a battery operation, the battery commander tentatively selects locations of key installations, plans the organization of the prospective landing zone, and coordinates procedures for control of aircraft during the occupation.

b. Prior to departing the pickup zone, the battery commander briefs the advance party on the new landing zone, the order of march, and the howitzer formation to be used.

c. Immediately upon arrival of the advance party in the landing zone, the battery commander or his representative designates battery center and confirms the howitzer formation to be used.

The location of the T-marker depends on established SOP. A guide from each howitzer section clears the immediate area around his position of any loose debris and obstacles and prepares the position to receive the equipment. Each guide displays a marking device of the same color as that assigned to his section.

d. If pathfinder or aviation personnel are not present, the battery commander or his representative, as the LACO, gives the pilot the color to guide on and the normal landing information as discussed in paragraph 7-56b(2).

e. Ammunition should be placed close to the howitzers during occupation.

f. Once the battery is on the ground, standard prepare for action procedures and the fire direction procedures outlined in FM 6-40 are followed.

g. The only elements necessary for positioning aircraft on return trips are approach instructions, artillery firing information, and a guide.

Section XI. AIRBORNE OPERATIONS

7-59. General

a. Airborne operations involve the movement by air of combat forces and their logistical support forces into an objective area for the execution of tactical and strategic missions. These forces may consist of airborne divisions, airborne divisions, infantry divisions, mechanized infantry divisions, air-transportable army missile commands, and other air-transportable units with supporting field artillery. Airborne operations may be joint operations in which Air Force and/or U.S. Navy aircraft are used or unilateral operations in which Army transport aircraft are used.

b. Light and medium field artillery normally accompanies the assault echelon in an airborne assault or the initial echelon in an airlanded operation. The airborne division artillery is trained to enter, and is capable of entering, combat entirely by parachute assault. The airborne division light artillery, the infantry division light and medium artillery, and nondivisional light and medium artillery are air transportable in medium transport aircraft and medium assault aircraft. Heavy cannon artillery and short-range missile artillery are air transportable in heavy transport aircraft. Very heavy cannon artillery and medium-range missile artillery are not air transportable without extensive disassembly. Artillery may support airborne operations from outside the objective area by providing long-range nuclear or nonnuclear fires.

c. Factors to be considered in planning for the employment of artillery in an airborne operation are as follows:

(1) The requirement for mass preassault nuclear and/or nonnuclear bombardment of enemy forces and installations in the objective area.

(2) The requirement for other preassault nuclear and/or nonnuclear fires.

(3) The capability of artillery to rig material for heavy-drop parachute delivery from aircraft or helicopters.

(4) The need for refresher training in air transportation techniques.

(5) The requirement for rigid security to deny the enemy knowledge of the planned operation and to preclude his use of nuclear fires against the departure area prior to the launching of the operation.

(6) The possibility of creating obstacles or excessive contamination in the objective area when nuclear fires are to be employed in the area prior to landing.

(7) The impracticability of conducting ground reconnaissance of position areas in the objective area and the need to determine accurate declination constants, survey data, and target intelligence from outside agencies.

(8) The requirement for communication between the airhead artillery headquarters and the artillery headquarters of linkup or supporting forces.

(9) The requirement for early establishment of centralized control of artillery in the assault phase.

(10) The need for a fire coordination line between airborne assault and linkup forces to prevent fires or the effects of fires of one force from interfering with the operation of the other force.

7-60. Plans and Estimates

Preliminary plans and estimates for airborne operations normally originate at theater level with the tentative selection of missions for the airborne units. Upon dissemination of the complete planning directive, concurrent and continuous planning is undertaken at all echelons of the affected units. Techniques and procedures for airborne planning are contained in chapter 10, FM 61-100. The commander and staff at each level of command should be included in the planning sessions of the next higher headquarters. Artillery representatives (fire support coordinators) should be included as members of the supported unit's planning group. This practice expedites concurrent planning at all echelons through personal coordination between successive headquarters. During the early phases, plans must be developed from estimates that may be based on assumptions and fragmentary information. Therefore, all plans are subject to change as more complete and reliable information becomes available to the subordinate units.

7-61. Training

a. An analysis of the mission of the airborne force and the elements of intelligence concerning the drop area and objective will indicate the type of training that must be stressed. Special attention will be devoted to training in loading aircraft. The types of aircraft that are to be allocated to each unit should be determined as early as possible. If the units are unfamiliar with the types of aircraft included in the allocations, addi-

tional training in loading will be necessary to insure efficient operation. Training will include complete rehearsals. Practice landing areas should resemble the actual landing areas as closely as possible.

b. Although it is desirable to drop or airland the artillery in areas already secured by the infantry, changing situations may force artillery units to defend themselves in the drop or landing zone or to fight their way to designated assembly or position areas. These probabilities require that artillery units be trained in infantry tactics to include fire and maneuver and use of individual weapons.

7-62. Communications

In airborne operations, radio is the principal means of ground-to-ground and air-to-ground communication. Visual signals and prearranged codes supplement radio and furnish quick and reliable communication, particularly between air and ground elements. Short wire lines, laid quickly by hand facilitate fire direction. Light aircraft may lay wire for longer distances when feasible. The communication plan must provide

for expansion from decentralized to centralized control and for communication with other supporting arms and services. The correct use of appropriate signal operation instructions (SOI) will reduce or eliminate much of the communication difficulties and confusion characteristic of early action in the area of operations.

7-63. Security

Surprise is a requisite for successful airborne operations. The amount of information that can be divulged to the troops and the time of its release are regulated at all echelons of command. Usually, only a few key personnel are briefed prior to being restricted to the marshaling area. However, every man is briefed on the operation as soon as security permits.

Section XII. NORTHERN OPERATIONS

7-64. General

Artillery units operating in northern areas are faced with two main problems—mobility and survival. Mobility (para 7-67) is a greater problem during the warmer months than during the colder months. One season of the year, equipment, and training affect the survival problem. Shelter and heat are major requirements for

troops operating in snow and extreme cold. Concentrations of troop shelters make profitable nuclear targets. The use of nuclear weapons may produce an unusually great number of casualties because of direct effects of the explosion, secondary fires, and subsequent exposure to extreme cold. In areas where the ground is frozen and no snow cover exists, personnel are particularly vulnerable to nuclear attack.

7-65. Plans and Preparation

Personnel and equipment must be made available well in advance of operations in a northern area so that training can be conducted under conditions similar to those anticipated in the area. Troops must be in peak physical condition and trained in their primary duty prior to entering areas of deep snow and extreme cold. Training should include instruction in survival, operations in subzero weather, sanitation, personal hygiene, and care of equipment in extreme cold. Special equipment must be used, and the equipment must be winterized and equipped with modification kits prior to arrival in extremely cold areas.

7-66. Survey

Survey in snow and extreme cold is slow and tedious. Lenses quickly become fogged. Computation of data is expedited when temporary shelter is provided. Control points are difficult to locate and will normally be found only along well-established roads and railroads. Because of deep snow, crevices, and other obstacles natural to arctic terrain, it is often simpler and faster to run a survey by following existing roads and trails, even though the cross-country distance is considerably shorter. The use of electronic equipment, such as the Tellurometer, makes survey more feasible.

7-67. Movement

Northern areas consist of varying types of terrain. Large areas are covered with coarse vegetation and boggy muskeg. Roads are scarce, and the heavy snow and the swamps restrict movement of wheeled vehicles. The best time of the year for cross-country movement of heavy vehicles is during the latter part of the freezeup period and the first part of the winter period prior to the arrival of heavy snow. The use of oversnow vehicles increases the mobility of the supply and reconnaissance echelons of the artillery unit. Self-propelled artillery weapons are more maneuverable than towed weapons; however, the present self-propelled artillery is too heavy to traverse deep snow in winter or muskeg in summer. In the summer, movement on waterways, such as lakes and rivers, is often possible. Extensive use should be made of helicopters in moving artillery.

7-68. Positions

a. Supply difficulties greatly influence the selection of position areas. Positions are chosen for their tactical utility and for protection from the

elements. Prior to occupation of a position, the terrain should be carefully reconnoitered and gun pits, traffic lanes, and snow parapets should be prepared. Direct support artillery should, when the situation permits, be located adjacent to or within the perimeter of infantry elements. During the winter period, it is impossible to dig in a position, but parapets of snow and ice can be erected. In extreme cold, some type of heated shelter will be required for personnel whose duties must be performed in the open.

b. Camouflage discipline must be strictly enforced. Limited camouflage can be obtained by application of paint. Tracks left in snow cannot be effectively covered except by fresh snowfall. Therefore, vehicles and troops must move only on designated trails and roads.

7-69. Observation

a. During the winter months, good observation is limited to a few hours each day because of the short periods of daylight. Snow cover reduces depth perception and obscures ground features and landmarks. Glare of the sun upon the snow is intense, and unless personnel are wearing dark glasses, continued exposure will cause painful snow blindness. Observing instruments must be equipped with amber filters to reduce eyestrain. Personnel operating observing instruments must be relieved frequently or provided with shelter. Forward observer teams should be well trained in the use of oversnow equipment and in rock-climbing techniques.

b. Extensive use of aerial observation is required. Army aircraft are invaluable for reconnaissance, location of targets, and adjustment of fire.

c. Standard countermortar radar and surveillance radar, like other electronic equipment, are sensitive to extremely low temperatures. When temperatures are low, heat must be applied to the console before it will operate. A heated shelter is required for plotting personnel.

d. Sound recorders are not affected by low temperatures. Microphones will function satisfactorily at low temperatures and under 4 to 6 inches of dry snow. The time required to establish a sound base in arctic regions is normally four to five times that required under normal conditions.

7-70. Field Artillery Fires

a. At times, especially during extremely cold periods and periods when temperature changes are sudden, the ballistic characteristics of weap-

ons and ammunition are affected. During extremely cold periods, a K factor of 100 meters or more per 1,000 meters of range is not uncommon. Fuze quick is ineffective in deep snow, as up to 80 percent of the fragmentation is absorbed by the snow cover. An airburst with either a variable time (VT) or mechanical time fuze is most effective against personnel in the open. Although VT fuzes are adversely affected by extreme cold and there is an increase in the number of malfunctions, the VT fuze is one of the most effective fuzes for the arctic. For information concerning the effects of nuclear weapons in snow, see the FM 101-31-series manuals; the FM 3-10-series manuals contain information concerning chemical weapons effects.

b. Deep snow may have an adverse effect on chemical shells; however, when the snow melts and is churned up, the chemical agent may pose a threat once again. The canister from a base-ejection shell may be smothered in the snow. The phosphorous shell will produce the desired smoke, but the phosphorous particles buried in the snow may be a hazard until the snow disappears.

c. During extreme cold, the rate of fire will be slow until the weapons have warmed; this is especially true of weapons that have a hydro-pneumatic-type recoil. Preparation of ammunition is slow when temperatures are low because of the reduced efficiency of personnel.

d. Under conditions of extreme cold, heating

blankets or other means of heating may be necessary to protect missile motors that use solid propellants.

7-71. Communications

a. Radio is a rapid and useful means of communication in northern areas. However, dry and wet cell batteries are seriously affected by extreme cold, both in storage and in operation. The efficiency and life of batteries decrease in direct ratio to the temperature.

b. Wire lines are normally restricted to existing trails and roads and are vulnerable to all existing hazards. Poles are broken by storms or uprooted by frost heaves. Wire laying by light aircraft is economical. This method should be employed when practicable. It is usually less time consuming to lay new lines than to attempt to repair old ones. Wire must be stored in a warm place up to the time of laying.

7-72. Maintenance

Maintenance is critical in northern operations. Careful monitoring of the use of vehicles and equipment, regular maintenance, and the use of arctic lubricants are necessary. Care must be taken in the disassembly of howitzers to prevent parts from freezing. If parts freeze, they cannot be reassembled. Ammunition, particularly proximity fuzes, must be stored carefully.

Section XIII. RIVERINE OPERATIONS

7-73. Definitions

a. *Riverine Area (Environment)*. A riverine area is an inland area with an extensive network of rivers, canals, streams, irrigation ditches, paddies, and/or swamps extending over broad, level terrain, parts of which may be inundated periodically or permanently. It may include sparsely populated swamps or forests, places where rivers and streams have steep banks densely covered with tropical trees or bamboo, and locations where the terrain is relatively flat and open. A large agrarian population may be concentrated along the waterways. Riverine areas near the ocean are affected by the tides.

b. *Riverine Operations*. Riverine operations include all military activities designed to achieve and/or maintain control of a riverine area by destroying hostile forces and restricting or eliminating hostile activities. Operations are characterized by the extensive use of water transport to

move military forces and equipment. Friendly ground forces may operate with Navy river forces, Air Force support units, or host country forces.

7-74. General

a. Environmental and tactical situations vary greatly in riverine operations. The environment varies with the tides and seasons. The variations in environment complicate operations conducted in an area with many differences in terrain.

b. Limited mobility in the riverine environment restricts certain aspects of combat support. Although support requirements are no more severe than normal, immediate response is essential. Units may be widely dispersed and, due to environmental restrictions, may not be mutually supporting. The lack of dry land, which many units need to accomplish their missions, may require the force commander to establish priorities

for the use of suitable and available land by unit/agency to facilitate planning and prevent confusion.

c. The principal problems confronting artillery in riverine operations could include inadequate survey control, poor maps, insufficient dry land for field artillery position areas, lack of valid meteorological data, and curtailed ability to mass fires when fire direction is necessarily decentralized.

d. Normal artillery tactics do not change. However the techniques of employing field artillery may change to fit the situation and terrain. Artillery operations in riverine areas may differ from those in other land warfare areas.

(1) Artillery may have to be prepositioned in hostile areas before the attack begins. Movement of the artillery and occupation of position will be conducted as an infantry-type operation with air/naval support and other artillery support. Additional forces for the security of the prepositioned artillery may be required.

(2) As in other ground operations, the artillery is organized for combat in accordance with the requirements of the operation. However, lack of adequate position areas and the requirement for use of water transport may limit the quantity and caliber of artillery to be employed.

(3) Position areas may be small and in insecure areas.

(4) Artillery batteries must be prepared to use all available means of transportation during an operation.

(5) Absence of positions in defilade, lack of cover and concealment, and positioning in insecure areas necessitate use of direct fire techniques and antipersonnel ammunition.

(6) Artillery may not be able to deliver accurate fires without adjustment due to a lack of survey control and valid meteorological data.

7-75. Movement

a. Movement of the artillery in the riverine environment is primarily accomplished through the use of watercraft and helicopters. Current manuals adequately describe procedures for land and air movement.

b. The force commander allocates boats/barges for use by the artillery.

c. The battery/battalion commander and the naval commander must coordinate their plans and movements with the forces providing air or artillery support and security.

d. Battery commanders/executive officers and boat commanders must insure that the course is

independently and continuously plotted and must verify their position with each other. This procedure insures accuracy of location if and when emergency occupation of position is necessary.

e. Air and artillery support, an air observer, and a radio relay capability are required for all artillery movements.

f. Buoy markers should be placed on howitzers and prime movers to facilitate recovery if a floating prime mover sinks.

g. The naval element, using the Monitor and assault support patrol boats (ASPB), furnishes boat security for the floating prime movers. Armed helicopters, tactical air, supporting artillery, and host country forces may provide additional support and route security on request.

h. A system of checkpoints is necessary to facilitate locating the water column during the move. Naval radar systems and Decca navigation equipment on board escort watercraft can be used by the artillery commander to provide position locations.

i. Current tidal information must be considered in conducting waterborne movements.

7-76. Positions

a. The fundamentals of positioning cannon artillery battalions and batteries specified in chapter 4, FM 6-140 apply to riverine operations.

b. When supporting an operation, batteries should be located in the combat base area when possible.

c. When the artillery is not waterborne during the rainy season, positions must be selected along canal and river banks and existing roads to the extent possible.

d. Desirable qualities of firing positions for barge- or boat-mounted artillery are:

(1) Steep banks below the surface of the water to minimize listing as the tide causes the water to fluctuate.

(2) Wide streams to the front or rear to reduce the danger of hand grenades and small-arms fire and to allow the use of antipersonnel ammunition.

(3) Limited avenues of approach over land.

(4) Areas that minimize anchorage problems. Areas of strong currents should be avoided when possible.

e. During some operations, it may be necessary to erect firing platforms on which to emplace weapons in swampy terrain.

7-77. Observation

a. Air observation in the riverine environment,

particularly during all waterborne movements, is essential due to the lack of commanding terrain.

b. Coordination between air observers and forward observers on the ground insures the best artillery coverage, coordination, and surveillance of the battle area.

c. Techniques and procedures for all types of observation (Part III, FM 6-40 and chapter 8, FM 6-140) apply to riverine operations.

d. Artillery observers must be able to adjust naval gunfire. Coordination of frequencies and circuits for obtaining naval gunfire is necessary before each operation. Current artillery procedures are used to adjust river assault squadron fire.

7-78. Fire Support Coordination

a. Fire Direction.

(1) Fire direction and fire planning in riverine operations follow conventional methods. Fire direction should be as centralized as possible. However, widely dispersed operations and special task assignments may make decentralization necessary.

(2) If afloat, battery and battalion fire direction centers are generally semipermanently installed on separate landing craft (LCM-8).

b. Coordination.

(1) Current doctrine prescribing techniques and procedures for planning and coordinating fire support (chap 5 and 6) is valid for riverine operations. Additional coordination and planning may be required before and during operations because the forces of two or more services may be involved.

(2) The company commander coordinates his own fire support and integrates available fire support with his scheme of maneuver or plan of defense. The company commander may have fire support from the battalion heavy mortar platoon, armed helicopter support, naval gunfire support, and the direct and indirect fires of Navy river assault squadron (RAS) boats.

(3) At battalion, the FSCC is located at the maneuver battalion command post or aboard a command and communication boat (CCB).

(4) At brigade, the FSCC is located at the brigade command post, aboard the brigade self-propelled barracks ship (APB), at the land base, or, when further forward, aboard a CCB.

7-79. Artillery Employment

a. *Self-Propelled.* When the self-propelled 155-mm howitzer M109 is employed from the

LCM-8, it can be fired while the LCM-8 is underway or anchored to the bank. Employment of the M109 howitzer from the LCM-8 is the same as that of barge-mounted artillery (b(1) below). The M109 howitzer has a 6,400-mil capability when employed from the LCM-8 and affords armor protection for the crew. The M109 LCM-8 combination does not require additional boat space for prime movers.

b. Towed.

(1) *Barge.* Towed 105-mm howitzers can be mounted on 90- by 30-foot artillery barges. One LCM-8 landing craft is used as the prime mover for each barge. The barge is positioned against the bank so that the howitzer can be laid in the normal manner. Aiming posts or collimators are placed on the banks to provide aiming references. The FDC for barge-mounted batteries is located in the well deck of the LCM-8 used to transport one of the barges. Wire communication from the FDC to the executive officer's post on the center barge or on the river bank is used for transmitting fire commands. Wire communication is also used between the executive officer's post and the guns.

(2) *Airmobile firing platform.* The airmobile firing platform is used in the riverine environment to provide a "land firing base" for light artillery. The platform is generally constructed of aluminum and is designed for use with the 105-mm howitzer M102. The platform can be employed in up to 4 feet of water or mud and can support a howitzer and crew and approximately 110 rounds of ammunition. The platform is replaced by a medium- or heavy-lift helicopter.

7-80. Survey

a. The absence of survey control in the riverine area necessitates the use of observed firing charts.

b. Support of water movements and patrols requires emphasis on the preplotting of targets and the establishment of control points from which firing data can be transferred.

c. If survey control points (SCP) are available and a unit is in an area of operations for a sufficient length of time, the distance-measuring equipment (DME) organic to the division artillery is used. The flat riverine terrain facilitates use of this equipment. Survey parties, augmented with security forces and using boats or helicopters, can establish survey control points.

7-81. Ammunition

The size of the ammunition loads of howitzer sections depends on the mode of transportation used. Artillery barges are capable of carrying from 1,200 to 1,500 rounds in their integral ammunition storage areas. The size of the ammunition

loads carried by landing craft and boats depends on the draft and cargo capacity of the craft and the number of craft available. The amount of ammunition delivered by helicopters will be limited to the allowable cargo load.



APPENDIX A

REFERENCES

A-1. Army Regulations

190-60	Physical Security Standards for Nuclear Weapons.
220-58	Organization and Training for Chemical, Biological, and Radiological (CRB) Operations.
310-25	Dictionary of United States Army Terms.
310-50	Authorized Abbreviation and Brevity Codes.
380-5	Safeguarding Defense Information.
380-20	Restricted Areas.
380-55	Safeguarding Defense Information in Movement of Persons and Things.
385-63	Regulations for Firing Ammunition for Training, Target Practice, and Combat.

A-2. Field Manuals

1-80	Aerial Observer Techniques and Procedures.
1-100	Army Aviation Utilization.
1-110	Armed Helicopter Employment.
3-8	Chemical Reference Handbook.
3-10	Employment of Chemical Agents.
(C) 3-10B	Employment of Chemical Agents (U).
3-12	Operational Aspects of Radiological Defense.
3-50	Chemical Smoke Generator Units and Smoke Operations.
5-26	Employment of Atomic Demolition Munitions (ADM).
6-2	Artillery Survey.
6-10	Field Artillery Communications.
6-15	Artillery Meteorology.
6-20-1	Field Artillery Tactics.
(C) 6-37	Field Artillery Battalion, SERGEANT (U).
(S) 6-39	Field Artillery Battalion, PERSHING (U).
6-40-series	Field Artillery Gunnery.
6-54	115-mm Area Toxic Rocket System.
6-61	Field Artillery Battalion, HONEST JOHN.
(C) 6-99-1	Special Procedures for Employment of Selected Ammunition with Cannon Artillery (U).
6-102	Field Artillery Battalion, Aerial Field Artillery.
6-115	The Field Artillery Searchlight Battery.
6-120	Field Artillery Target Acquisition Battalion and Batteries.
6-121	Field Artillery Target Acquisition.
6-122	Artillery Sound Ranging and Flash Ranging.
6-135	Adjustment of Artillery Fire by the Combat Soldier.

6-140	Field Artillery Cannon Battalions and Batteries.
(C) 6-141-1	Nonnuclear Employment of Field Artillery Weapon Systems (U).
(C) 6-155-1	Special Procedures for Employment of Selected Ammunition with Free Rockets (U).
6-160 series	Radar Sets.
7-11	Rifle Company, Infantry, Airborne, and Mechanized.
7-20	The Infantry Battalions.
7-30	The Infantry Brigades.
8-10	Medical Service, Theater of Operations.
8-15	Medical Service in Divisions, Separate Brigades, and the Armored Cavalry Regiment.
9-6	Ammunition Service in the Theater of Operations.
9-6-1 (Test)	Ammunition Service in the Theater of Operations, TASTA-70.
10-8	Airdrop of Supplies and Equipment in the Theater of Operations.
17-1	Armor Operations.
17-30	The Armored Brigade.
17-95	The Armored Cavalry Regiment.
20-33	Combat Flame Operations.
20-60	Battlefield Illumination.
21-26	Map Reading.
21-30	Military Symbols.
21-31	Topographic Symbols.
21-40	Chemical, Biological, Radiological, and Nuclear Defense.
21-41	Soldier's Handbook for Defense Against Chemical and Biological Operations and Nuclear Warfare.
21-48	Chemical, Biological, and Radiological (CBR) and Nuclear Defense Training Exercises.
23-17	REDEYE Guided Missile System.
23-92	4.2-inch Mortar, M30.
24-1	Tactical Communications Doctrine.
24-16	Signal Orders, Records, and Reports.
24-17	Tactical Communications Center Operation.
24-18	Field Radio Techniques.
24-19	Communications-Electronics Reference Data.
24-20	Field Wire and Field Cable Techniques.
30-5	Combat Intelligence.
30-20	Aerial Surveillance-Reconnaissance, Field Army.
31-10	Denial Operations and Barriers.
31-11	Doctrine for Amphibious Operations.
31-12	Army Forces in Amphibious Operations (The Army Landing Force).
31-16	Counter guerrilla Operations.
31-21	Special Forces Operations—U.S. Army Doctrine.
31-22	U.S. Army Counterinsurgency Forces.
31-23	Stability Operations, U.S. Army Doctrine.
31-25	Desert Operations.
31-35	Jungle Operations.

31-36 (Test)	Night Operations.
(C) 31-40	Tactical Cover and Deception (U).
31-50	Combat in Fortified and Built-up Areas.
31-60	River-Crossing Operations.
31-70	Basic Cold Weather Manual.
31-71	Northern Operations.
31-72	Mountain Operations.
31-73	Advisor Handbook for Stability Operations.
31-75 (Test)	Riverine Operations.
(C) 32-5	Signal Security (SIGSEC) (U).
33-5	Psychological Operations—Techniques and Procedures.
41-5	Joint Manual for Civil Affairs.
41-10	Civil Affairs Operation.
44-1	U.S. Army Air Defense Artillery Employment.
44-2	Air Defense Artillery Employment, Automatic Weapons M42/M55.
54-4	The Support Brigade.
55-30	Army Motor Transport Operations.
57-1	U.S. Army/U.S. Air Force, Doctrine for Airborne Operations.
57-35	Airmobile Operations.
61-24	Division Communications.
61-100	The Division.
100-5	Operations of Army Forces in the Field.
100-10	Combat Service Support.
100-27	U.S. Army/U.S. Air Force Doctrine for Tactical Airlift Operations.
101-5	Staff Officers' Field Manual: Staff Organization and Procedure.
101-10-series	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data.
101-31-series	Staff Officers' Field Manual: Nuclear Weapons Employment.

A-3. Technical Manuals

8-210	Fallout Prediction.
8-220	Chemical, Biological, and Radiological (CBR) Decontamination.
9-1300-206	Care, Handling, Preservation, and Destruction of Ammunition.
55-series	Transportation.
55-450-15	Air Movement of Troops and Equipment (Administrative).

A-4. Department of the Army Pamphlets

39-3	The Effects of Nuclear Weapons.
310-1	Military Publications: Index of Administrative Publications.
310-3	Military Publications: Index of Doctrinal, Training, and Organizational Publications.

- 310-4 Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
- 350-15-series Operations—Lessons Learned.

A-5. Miscellaneous Publications

- ATP 6-100 Field Artillery Cannon Units.
- JCS Pub 1 Dictionary of U.S. Military Terms for Joint Usage.
- TC 3-16 Employment of Riot Control Agents, Flame, Smoke, Antiplant Agents, and Personnel Detectors in Counterguerrilla Operations.

APPENDIX B

DEFINITIONS

(For definitions not shown here, see AR 310-25,
Dictionary of United States Army Terms)

Airspace control element—An element in the TOC that coordinates the use of airspace over the command area.

Authority to expend—A specified number of complete special ammunition rounds authorized for expenditure by a command. Authority to expend may be made for a specific period of time, for a phase of an operation, or to accomplish a particular mission.

Buffer zone—The area immediately adjacent to friendly troops into which armed helicopters will not fire.

Cancel—When coupled with an order, other than an order for a quantity or type of ammunition, cancel rescinds that order.

Counterflak fire—Fire used to suppress antiaircraft fire immediately prior to or during an air attack on enemy positions.

Defensive fire—Fire delivered by supporting units to assist and protect a unit engaged in a defensive action.

Direct air support—All forms of air support provided to land or naval forces which immediately assist those forces in the tactical battle.

Free-fire area—A specific, designated area into which any fire support means may deliver fires against known or suspect ground targets without any coordination between the force requesting and/or delivering the fires and the agency that established the free-fire area.

Free fire line—A free fire line is a line beyond which fire may be delivered without any coordination between the force requesting or delivering the fire and the agency establishing the free fire line. The free fire line is used primarily during stability operations and normally requires approval by the host country. The division artillery coordinates the establishment of the free fire line within the division and disseminates the location and guidance on the free fire line to the division fire support element and

higher, organic, attached, supporting and adjacent units.

Group of targets—Two or more targets in the same general area on which fire is desired simultaneously. A group of targets may be designated by a letter/number combination or by a nickname.

Hovering fire—Fire delivered by an armed helicopter as it momentarily rises from a covered or concealed position.

Illumination fire—Fire designed to illuminate an area.

Immediate air request—A request by a ground commander for a close air support strike on a target which is exposed by battlefield developments and which, by its nature, could not be identified sufficiently in advance to permit detailed mission coordination and planning.

Marking fire—Fire placed on a target for the purpose of identification.

Naval gunfire officer—A special staff officer of a troop unit (division or higher) whose duties pertain to the planning and execution of naval gunfire support and naval gunfire training and to the coordination of naval gunfire with other supporting arms.

No-fire area—A specific, designated area into which no fire support means will deliver fires and into which no effects from fires will extend. Exceptions are: (1) On a mission basis when approved or requested by the establishing agency; (2) When a major threat exists and the commander has insufficient time to obtain approval.

Offensive fire—Fire delivered by supporting units to assist and protect a unit engaged in an offensive action.

On-call target—A planned target, other than a scheduled target, for which a need can be anticipated.

Planned target—An anticipated target on which

fire is prearranged. Planned targets may be scheduled or on call.

Program of targets—Planned targets of a similar nature, such as hostile cannon, mortars, missiles, and command installations. A program may be scheduled or fired on call.

Quick artillery fire support plan—A document that is prepared at a lower echelon in support of a quick attack and that contains the necessary elements of an artillery fire support appendix.

Running fire—Fire delivered by an armed helicopter while the helicopter is in forward flight.

Scheduled target—A target on which fire is to be delivered at a specific time during the operation of the supported force. The time is specified in terms of minutes before or after H-hour or in terms of the accomplishment of a predetermined movement or task.

Series of targets—A number of targets and/or groups of targets planned to support a maneuver phase. A series of targets may be indicated by a nickname.

Stationary fire—Fire delivered by an armed helicopter from a static ground position.

Superimposed—A term used in fire planning to indicate that an artillery unit is bolstering fire on a target and that its fire may be lifted from that target by the authority implicit in its fire support role (non-U.S.).

Target overlay—A transparent sheet which, when superimposed on a particular chart, map, drawing, tracing, or other representation, depicts target locations and designations. The target overlay may also show boundaries between maneuver elements, objectives, and friendly forward dispositions.

APPENDIX C

TARGET NUMBERING SYSTEM

C-1. Purpose

A target numbering system must provide for the following requirements:

a. Identification of Planning Source. The planning source of each target should be readily identifiable so that each artillery and force echelon can obtain or provide additional information, eliminate conflicts and duplications, and notify the originator of the action taken on requests.

b. Preclusion of Duplication. Each target within a corps area should have a separate and distinctive designation. This permits a rapid resolution of duplication and a quick response to fire requests.

c. Compatibility with Computer. In the near future, the target numbering system for computers will be a combination of two letters and four digits.

(1) Each target number will consist of two alphabetic positions followed by four numerical positions. Until all ABCA countries (America, Britain, Canada, Australia) have secure communications, the United Kingdom, Canada, and Australia (UK/CDA/AUST) will identify their targets by the letter Z in the first alphabetic position. This use of Z is shown in paragraph C-2a(2).

(2) When all ABCA countries have the post-1970 computer equipment, they will use the target numbering system herein described without the Z set-aside portion.

d. Distinctive Identification of Special Weapons Targets. The target numbering system should differentiate between conventional and special weapons targets and between various types of special weapons targets; e.g., nuclear and chemical targets.

(1) *Nuclear.* The current system is a classified NATO procedure.

(2) *Chemical.* Because of the relatively large area of effects, the variances that are based on atmospheric conditions, and the troop safety con-

siderations, the target areas have distinctive identification.

e. Distinctive Identification of Counterbattery Targets. Counterbattery targets should have distinctive identification because of the special acquisition measures, the programs of targets, and the methods of engagement.

f. Security. The target numbering system must conform to security requirements.

C-2. System

A target is designated by two elements—a two-letter group and a four-digit group.

a. Letters. The two-letter group denotes the originator of the target in the U.S. system and the level of classification in the UK/CDA/AUST system. The letters I and O will not be used. Letter designations in a type corps are allotted as follows:

(1) U.S. (letters assigned by corps).	Letters
Attached divisions in numerical order (first letter).	A through G
Armored cavalry regiment (first letter).	H
Additional separate regiments, brigades, and as desired (first letter).	J through W
Artillery groups of corps artillery.	XA through XE
Additional, corps, artillery groups, separate battalions, and as desired.	XF through XX
Corps artillery FDC	XY
Corps FSE	XZ
Not used (first letter)	Y and Z
(2) UK/CDA/AUST (assigned letters).	
As desired	ZA through ZN
Batteries	ZP through ZS
Field regiment	ZT
Division artillery	ZU
Artillery with the corps	ZV
Corps artillery units	ZW
As desired	ZX
Not used	ZY and ZZ

(3) *U.S.* (letters assigned by division). In U.S. divisions, a second letter is assigned to each major subordinate unit.

<i>U.S. units</i>	<i>Letters</i>
Brigades in numerical order	A through E
Organic artillery battalions in numerical order.	F through L
Attached artillery or as desired.	M through W
Not used	X
Division artillery FDC	Y
Division FSE	Z

(4) *U.S.* (other corps units). Units which have been assigned an alphabetical designation and which are responsible for fire planning (e.g., separate brigades) may assign a second letter to their subordinate units, as desired.

b. Numbers. The four-digit group follows the two-letter group to designate each specific target as a separate entity.

(1) *U.S. units.* Units assigned a two-letter group assign numbers as shown in (a) through (g) below.

(a) *Brigades of the division.*

<i>Units</i>	<i>Numbers</i>
Lowest numbered maneuver battalion attached.	0001 through 0199
Next higher numbered maneuver battalion attached.	0200 through 0399
Next higher numbered maneuver battalion attached.	0400 through 0599
Next higher numbered maneuver battalion attached.	0600 through 0799
Next higher numbered maneuver battalion attached.	0800 through 0999

(b) *Maneuver battalions of divisional brigades.* Within the block of 200 numbers assigned to a maneuver battalion, the following groups of numbers may be further assigned to subordinate units:

<i>Units</i>	<i>Numbers</i>
Battalion headquarters, as desired.	0__01 through 0__49
Heavy mortar platoon	0__50 through 0__99
Company A	0__00 through 0__24
Company B	0__25 through 0__49
Company C	0__50 through 0__74
Company D	0__75 through 0__99
<i>Note.</i> The first digit (thousands) will always be zero. The second digit will vary with each maneuver battalion.	

(c) *Direct support artillery battalions of division artillery.*

<i>Units</i>	<i>Numbers</i>
Liaison officer (LO) at brigade FSCC.	1000 through 1999
LO with lowest numbered maneuver battalion (FSCC).	2000 through 2999
LO with next higher numbered maneuver battalion (FSCC).	3000 through 3999
LO with next higher numbered maneuver battalion (FSCC).	4000 through 4999
LO with next higher numbered maneuver battalion (FSCC).	5000 through 5999
LO with next higher numbered maneuver battalion (FSCC).	6000 through 6999
Field artillery battalion FDC, as desired (firing batteries of the battalion).	7000 through 7999
Counterbattery targets	8000 through 8999
Chemical targets	9000 through 9999

(d) *Forward observers.* The targets planned by the artillery forward observers will be assigned numbers by the artillery liaison officer with the maneuver battalion or task force from his block of allotted numbers.

(e) *All other headquarters with an alphabetical designation responsible for fire planning.*

1. The block of numbers 0001 through 0999 is reserved for maneuver units.

2. The block of numbers 1000 through 9999 is reserved for artillery units. Numerical designations can be made as desired except that the blocks of numbers 8000 through 8999 and 9000 through 9999 will be reserved for counterbattery and toxic chemical targets, respectively.

(f) *Targets to be engaged with air-delivered weapons.*

1. *Conventional.* The S3 (G3) air will obtain numbers from the FSCC/FSE's blocks of assigned numbers with which to designate the targets to be engaged by aircraft.

2. *Nuclear.* Targets to be engaged with air-delivered nuclear weapons are designated by numbers from the classified four-digit block assigned to that command echelon.

3. *Chemical.* Targets to be engaged with air-delivered toxic chemical weapons are designated by numbers from the 9000 through 9999 block of numbers assigned to that command echelon.

(g) *Targets to be engaged by naval gunfire.* Naval gunfire spotters and liaison officers will obtain numbers from the FSCC/FSE's blocks of numbers. Each naval ship assigned a tactical mission (i.e., direct support, general support) is assigned a two-letter group in the same manner as attached artillery.

(2) *UK/CDA/AUST units.* Blocks of classified four-digit numbers are assigned to command echelons. There is no duplication of numbers. The 8000 through 8999 and the 9000 through 9999 blocks of numbers are reserved for counterbattery and chemical targets, respectively.

(3) *Joint techniques.*

(a) *Counterbattery targets.* Counterbattery targets are identified by the block of numbers 8000 through 8999.

(b) *Chemical targets.* Toxic chemical targets are identified by the block of numbers 9000 through 9999, which are assigned by the CP/FSCC/FSE of the echelon that is assigned biological and chemical munitions.

(c) *Nuclear targets.* Classified numbers are allocated to the corps and, in turn, to the division and the brigades.

C-3. Modifications

Modifications to the target numbering system should be confined to the headquarters making

the modifications. Such modifications should not be reflected in target information transmitted from one headquarters to another.

C-4. Security

a. U.S.

(1) Target numbers may be sent in the clear when the tactical situation demands or when the enemy does not possess the intelligence-gathering capability to determine friendly order to battle information or the location of friendly units.

(2) When the enemy possesses the capability to determine order to battle information and the location of friendly units, target numbers should be sent over secure means of communications or the letter prefixes should be encoded for transmission over insecure means. Current on-line cryptographic equipment, classified radio-telephone call signs, and operations codes provide quick, secure means of transmission. Secure digital data devices, voice scramblers, and other items expected to be available by post-1970 will provide additional capabilities for security.

b. *UK/CDA/AUST.* Target numbers are allotted to units/formations in jumbled blocks. The allocation is classified.

Chart C-1. United States/United Kingdom/Canada/Australia Target Numbering System

FM 6-20-2

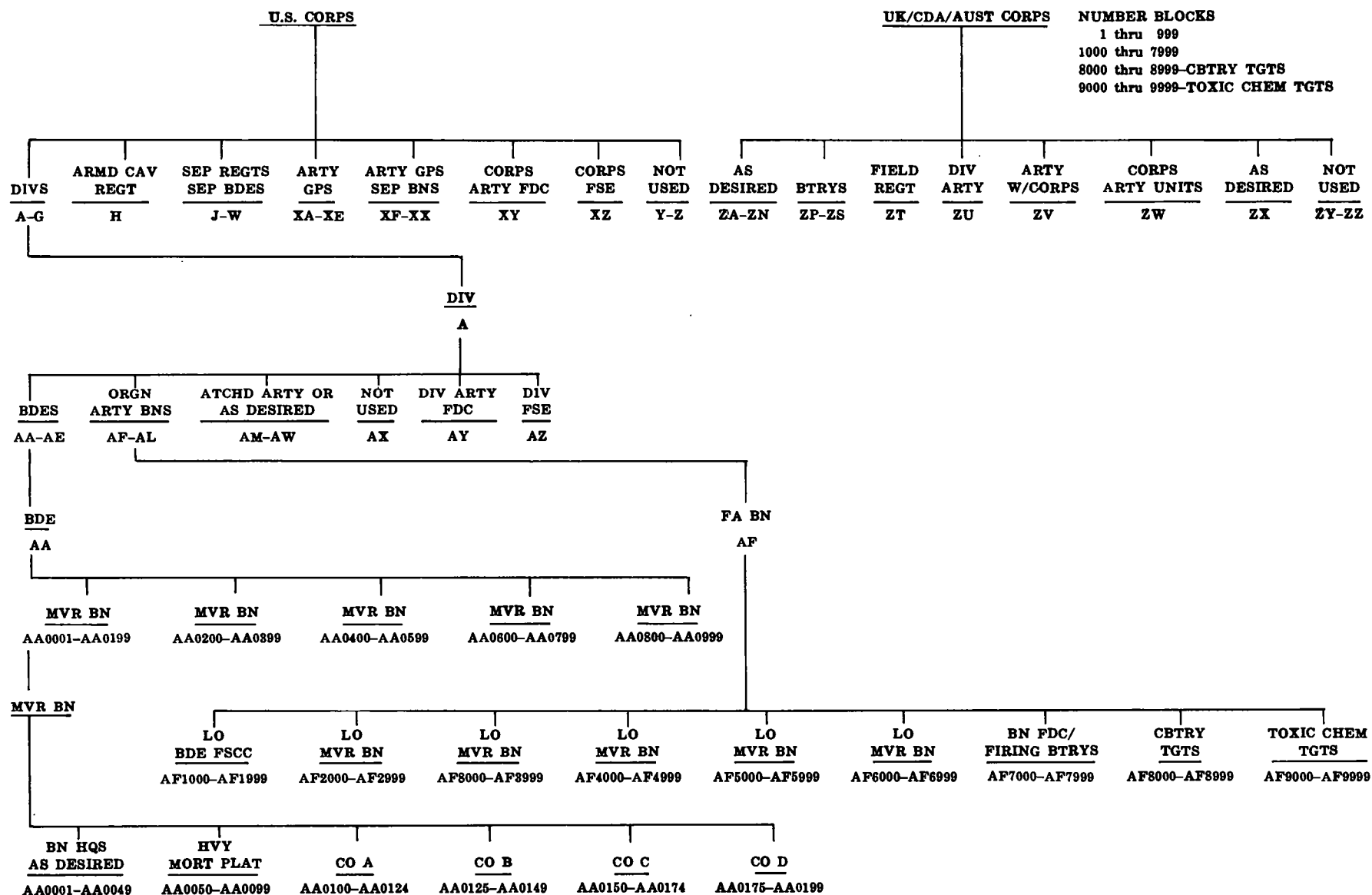
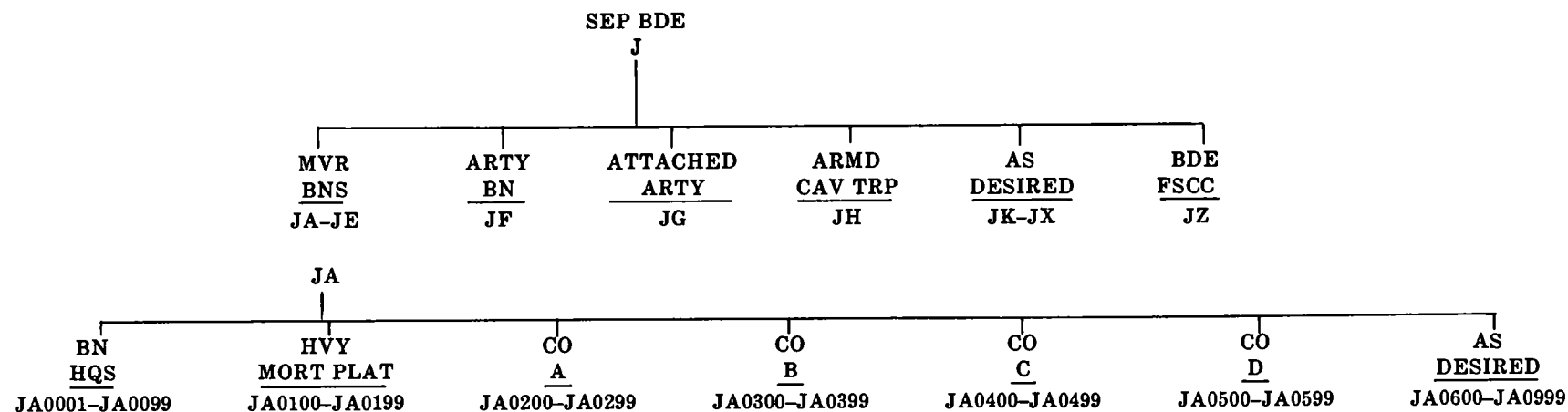


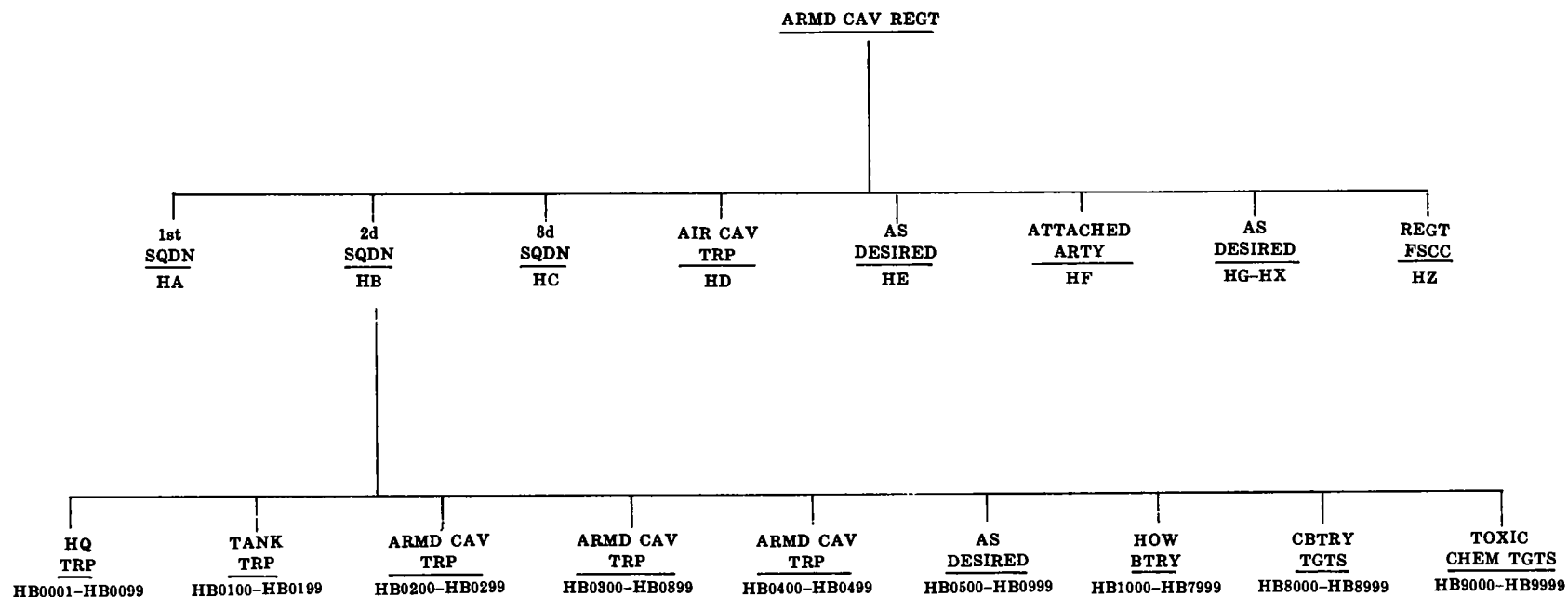
Chart C-2. Separate Brigade



Note 1. The artillery target numbering system for a separate brigade is the same as that for a direct support artillery battalion organic to a division.

2. When an artillery group is attached to the brigade, the artillery group headquarters will be assigned the two-letter prefix JG. Each of the battalions of the group will be assigned a two-letter prefix from the block of letters JK through JX.

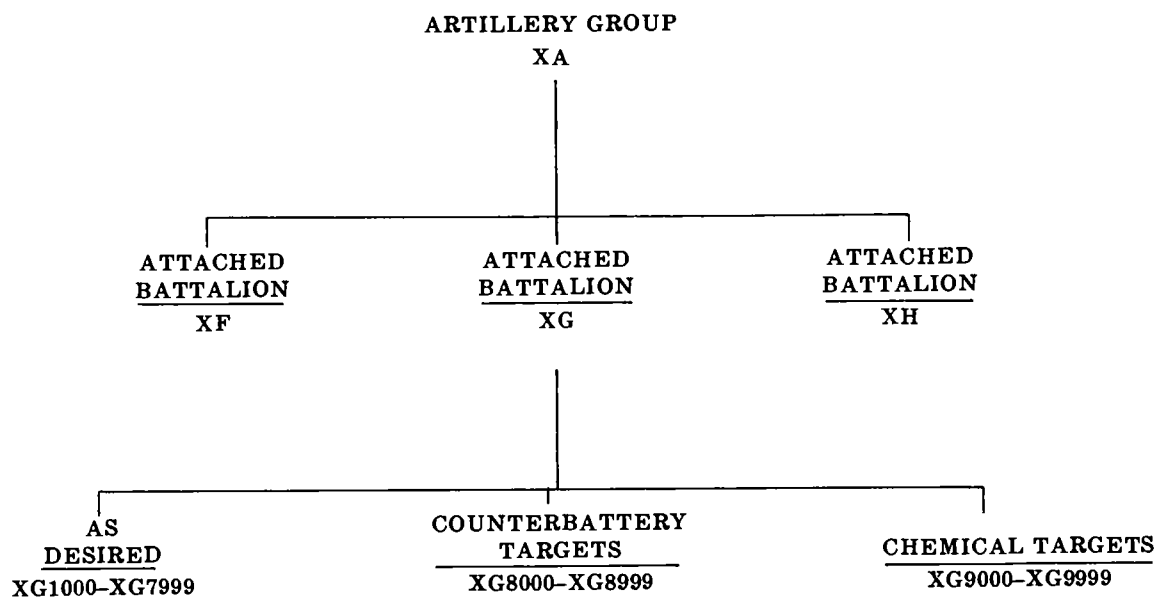
Chart C-3. Armored Cavalry Regiment



Note 1. The artillery target numbering system for an armored cavalry regiment is the same as that for a direct support artillery battalion organic to a division.

Note 2. When an artillery unit is attached to or placed in direct support of the armored cavalry regiment, the artillery unit will be assigned the two-letter prefix HF. When an artillery group is attached to or placed in direct support of the regiment, the artillery group headquarters will be assigned the two-letter prefix HF. Each of the battalions of the group will be assigned a two-letter prefix from the block of letters HE through HX.

Chart C-4. Artillery Group





APPENDIX D

CORPS FIRE SUPPORT ANNEX

(Classification)

Copy No 5
2d US Corps
VEGESACK (0507), GERMANY
231600 May 19__
CEG 41

Annex D (Fire Support) to OPORD 16

Reference: Map, GERMANY, 1:100,000, Sheets Q4, Q5, R4, and R5.

1. SITUATION

- a. Enemy Forces. Annex A (Intelligence).
- b. Friendly Forces.

(1) 1st US Army continues atk 24 May to trap and destroy enemy between the WAMME (NB3866) and OSTE (NCO244) Rivers and prepares to cont atk to the north.

(2) 1st Corps attacks 24 May to seize crossings over WAMME (NB-4653) and HUNTE (NC5944) Rivers and to destroy enemy in zone.

(3) 9th TAF supports 1st U.S. Army.

(4) 1st Bn (Pershing), 96th FA: GS 1st Army; priority of fires to 2d Corps.

(5) Naval support: Naval Fire Support Group (TG 34.1) supports 2d Corps.

c. Attachments and Detachments. 10 May task organization; 1st Bn (AW) (SP), 48th ADA, atch eff 232000 May.

2. MISSION

Field artillery with the corps and other fire support agencies support 2d U.S. Corps operations with special and conventional field artillery, naval gunfire, air support, and air defense artillery fires. Corps attacks 240830 May to seize north bank of the GRUNIG River and to destroy enemy in zone.

3. EXECUTION

- a. Concept of Operation. OPORD 16.
- b. Air Support.

(1) General.

(a) Current air operations continue.

(b) Priority of available air support to 10th Inf Div (Mech).

(2) Allocations.

(a) Air support allocated to 2d U.S. Corps; 250 sorties per day for period 240300 to 260300 May. TAF provides air alert aircraft for heliborne operations on request.

(Classification)

 (Classification)

- (b) Suballocation of daily sorties for planning purposes:
- | | |
|---------------------|-----|
| 2d Corps | 33 |
| 1st Inf Div | 32 |
| 12th Inf Div (Mech) | 40 |
| 10th Inf Div (Mech) | 100 |
| 4th Armd Div | 45 |
- (c) TACP assignment: SOP.
- (d) DASC located at TOC.
- (3) Miscellaneous. Appendix 1 (Air Fire Support).
- c. Artillery Support.
- (1) FA.
- (a) General. Arty supports the atk with a preparation beginning with special and conventional fires at H-25.
- (b) Organization for combat.
1. 101st FA Gp; GS
 - 2d Bn (155-mm, SP), 50th FA
 - 2d Bn (155-mm, Towed), 51st FA
 - 1st Bn (8-in, SP), 70th FA
 - 1st Bn (HJ), 82d FA
 - 2d Bn (HJ), 82d FA
 2. 103d FA Gp; GS
 - 4th Bn (155-mm, SP), 50th FA
 - 2d Bn (175-mm, SP), 62d FA
 - 2d Bn (8-in, SP), 70th FA
 - 3d Bn (8-in, SP), 70th FA
 - GSR 10th Inf Div (Mech) FA
 3. Btry A (Slt), 37th FA: GS.
 4. 1st Bn (Tgt Acq), 39th FA: GS.
- (c) Miscellaneous.
1. Restrictions on arty fires during heliborne operations to be announced.
 2. Priority of position areas to nuclear firing units.
 3. HJ HE Authority to expend (240600-260600 May).

2d Corps	10
1st Inf Div	3
12th Inf Div (Mech)	3
10th Inf Div (Mech)	8
4th Armd Div	3
Total	27
 4. Appendix 2 (Artillery Fire Support).
- (2) Air defense artillery.
- (a) General. Air defense artillery will provide air defense for all divisions in the corps sector.
- (b) Organization for combat.
- 1st Bn (C/V) (SP), 48th ADA: Atch 10th Inf Div (Mech) eff 232000 May.
- 2d Bn (C/V) (SP), 48th ADA: Atch 12th Inf Div (Mech) eff 232000 May.
- 3d Bn (C/V) (SP), 48th ADA: Atch 1st Inf Div eff 232000 May.
- 4th Bn (AW) (SP), 48th ADA: Atch 4th Armd Div eff 232000 May.
- 5th Bn (AW) (SP), 48th ADA: Protect in priority corps CP, nuclear delivery units, and corps artillery CP.

 (Classification)

(Classification)

(c) Miscellaneous. Appendix 3 (Air Defense Artillery Fire Support).

d. Chemical Support.

(1) General. Lethal chemical agents will be employed on enemy forward positions to assist in the penetration.

(2) Authority to expend (240600-260600 May).

Unit	Total GB/VX	155-mm how GB/VX	8-in how GB/VX	HJ GB	M91 (ripples) GB/VX	Air (bomb) GB
2d Corps	2912/1575	2400/1200	100/60	12	0/0	400
1st Inf Div	2818/1508	2400/1200	80/40	6	12/12	320
12th Inf Div (Mech)	2800/1569	2300/1200	80/40	6	14/14	400
10th Inf Div (Mech)	2920/1808	2500/1500	80/40	8	12/12	320
4th Armd Div	2618/1308	2200/1000	80/40	6	12/12	320

(3) Miscellaneous. Appendix 4 (Chemical Fire Support).

e. Naval Gunfire Support.

(1) General. TG 34.1 supports 2d U.S. Corps during period 240600 to 260600 May. Ships will participate in preparation fires with conventional ammunition.

(2) Allocations.

(a) TU 34.12 supports 10th Inf Div (Mech).

(b) TU 34.13 supports 1st Inf Div.

(3) Miscellaneous. Appendix 5 (Naval Gunfire Support).

f. Nuclear Fire Support.

(1) General.

(a) Ninety-two nuclear weapons allocated to 2d Corps. Yields from 1 to 20 KT.

(b) Atk means available within corps are arty cannon and missile. Tac air available on request.

(2) Authority to expend (240500-261800 May).

Unit	Total	155-mm/ MK___/___ KT	8-in/MK___/ ___KT	8-in/MK___/ ___KT	HJ/MK___/ ___KT	Air delivered MK___/___ KT	MK___/___ KT
1st Inf Div	21	10	2	2	5	1	1
12th Inf Div (Mech)	14	5	4	1	3	0	1
10th Inf Div (Mech)	22	9	3	2	6	1	1
4th Armd Div	13	8	1	1	2	1	0
2d Corps	22	7	4	1	6	2	2
Total	92	39	14	7	22	5	5

(3) Miscellaneous. Appendix 6 (Nuclear Fire Support).

g. Coordinating Instructions.

(1) Troop safety.

(Classification)

 (Classification)

(a) Minimum safe distances as indicated in Appendix 6 (Nuclear Fire Support).

(b) Warning per corps SOP.

(2) Report of damage assessment to TOC on completion of study.

(3) Air and arty fire support appendixes to corps FSE by 232400 May.

(4) Air targets will be marked with yellow smoke.

(5) FSCL is RED River eff 240700 May.

(6) Counterbattery status is active. Criteria same as OPORD 15.

4. SERVICE SUPPORT

a. ADMINO 2.

b. Available supply rate (240500-261800 May).

105-mm how	160
------------	-----

155-mm how	130
------------	-----

175-mm gun	80
------------	----

8-in how	100
----------	-----

40-mm gun	300
-----------	-----

c. Special ammunition load, SASP locations, and resupply instructions: Appendix 8 (Special Ammunition Logistics).

5. COMMAND AND SIGNAL

a. Signal.

(1) SOI, Index 1-7, eff 220001 May.

(2) Joint SOI, Index 22-3a, eff 220001 May.

(3) Notification of intent to fire to Corps FSE on all nuclear strikes except 155-mm/MK_/KT_ NLT 25 minutes prior to TOT.

b. Command.

(1) Corps FSE located at corps CP.

(2) Corps artillery CP, PS0508.

(3) DASC located at corps CP.

Acknowledge.

MORROW
LTG

OFFICIAL:

/s/Spigarelli

SPIGARELLI

G3

Appendixes: 1—Air Fire Support

2—Artillery Fire Support

3—Air Defense Artillery Fire Support

4—Chemical Fire Support

5—Naval Gunfire Support

6—Nuclear Fire Support

7—Illumination Support

8—Special Ammunition Logistics (omitted)

 (Classification)

(Classification)

Distribution: A

1st Corps

3d Corps

Naval Fire Support Group (TG 34.1)

9th TAF

(Classification)



1

2



3

4

5

6



7

8

APPENDIX E

DIVISION FIRE SUPPORT ANNEX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
232000 May 19___
CW 229

Annex C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

1. SITUATION

a. Enemy Forces.

(1) Annex A (Intelligence) to OPORD 25.

(2) Enemy air capable of 30 bomber and 100 fighter-bomber sorties per day in zone of 2d Corps.

b. Friendly Forces.

(1) 2d Corps attacks 240830 May with 1st Inf Div on the east, 10th Inf Div (Mech) on the west; seizes the north bank of the GRUNIG River; and destroys enemy in zone.

(2) 9th TAF supports 2d corps with allocation of 250 CAS sorties daily for period 240300 to 260300 May. Priority to 10th Inf Div (Mech).

(3) Artillery support.

(a) 1st Bn (Pershing), 96th FA: GS 1st Army; priority of fires to 2d Corps.

(b) 101st FA Gp: GS 2d Corps.

(c) 103d FA Gp: GSR 10th Inf Div (Mech)

4th Bn (155-mm, SP), 50th FA

2d Bn (175-mm, SP), 62d FA

2d Bn (8-in, SP), 70th FA

3d Bn (8-in, SP), 70th FA

(4) Naval support. Fire Support Unit Two (TU 34.1.2) provides spt to 10th Inf Div (Mech).

c. Attachments and Detachments. None.

2. MISSION

Division artillery and supporting fire elements spt 10th Inf Div (Mech) operations with special and conventional ammunition to include artillery, air support, naval gunfire, and air defense fires.

3. EXECUTION

a. Concept of Operation. 10th Inf Div (Mech) will atk 240830 to seize objectives on north bank of GRUNIG River and to destroy enemy in zone.

(Classification)

 (Classification)

A 35-minute combined special and conventional ammunition preparation fire will commence at H-25.

b. Air Support.

(1) General. Aircraft will be required for armed reconnaissance of air routes, combat air patrol, and normal close air support functions.

(2) Allocations.

(a) 2d Corps allocated 250 CAS sorties per day. Priority to 10th Inf Div (Mech).

(b) 10th Inf Div (Mech) allocated 100 sorties per day for planning purposes for period 240300 to 260300 May. Priority to 1st Bde.

(3) Miscellaneous. Appendix 1 (Air Fire Support).

c. Artillery Support.

(1) FA.

(a) General. Artillery will spt the atk initially with a special and conventional ammunition preparation commencing at H-25.

(b) Organization for combat.

Div arty

1-2 FA: DS 1st Bde.

1-4 FA: DS 2d Bde.

1-6 FA: GSR 1-2 FA; o/o DS 3d Bde.

1-18 FA: GS; o/o GSR 1-6 FA.

1-20 FA: GS.

(c) Miscellaneous.

1. HJ authority to expend (240600-260600 May).

Div	8
1st Bde	0
2d Bde	0
3d Bde	0

2. Priority of artillery fires to 1st Bde initially; o/o priority to 3d Bde when committed.

3. Maximum ordinate of artillery fires in Area BRAVO is 5,000 meters from 240800 to 241200 May.

4. Priority of position areas.

(a) Nuclear firing units.

(b) Direct support units.

(c) Other.

5. Appendix 2 (Artillery Fire Support).

(2) ADA.

(a) General. Air defense artillery will provide air defense for nuclear firing units, division artillery, and division CP.

(b) Organization for combat. 1st Bn (AW) (SP), 48th ADA: Protect in priority division nuclear firing units, division artillery, and division CP.

(c) Miscellaneous. Appendix 3 (Air Defense Artillery Fire Support).

d. Chemical Support.

(1) General. Fire support agencies will employ lethal chemical agents on enemy forward defensive positions to assist in the penetration. Tactical air and artillery will fire a 5-minute "VX" only preparation commencing at H-25.

 (Classification)

(Classification)

(2) Authority to expend (240600-260600 May).

Unit	155-mm how GB/VX	8-in how GB/VX	HJ GB	M91 (ripples) GB/VX	Air (bomb) GB
10th Inf Div (Mech)	800/600	80/40	8	6/6	224
1st Bde	600/300			2/2	32
2d Bde	600/300			2/2	32
3d Bde	500/300			2/2	32
Total	2500/1500	80/40	8	12/12	320

(3) Miscellaneous.

(a) Weather dissemination per 10th Inf Div (Mech) SOP.

(b) Appendix 4 (Chemical Fire Support).

e. Naval Gunfire Support.

(1) General. Naval gunfire ships will fire conventional ammunition preparation from H-15 to H-4.

(2) Allocations.

(a) FSA I: CA78, DD856, DD854.

(b) FSA II: CA73, DD886, DD884.

(c) TU 34.1.2 supports 10th Inf Div (Mech) from fire support areas (FSA) in (a) and (b) above.

(3) Miscellaneous.

(a) Trajectory limitations to be announced through fire support coordination channels.

(b) Appendix 5 (Naval Gunfire Support).

f. Nuclear Fire Support.

(1) General. Nuclear preparation will be fired from H-25 to H-15.

(2) Authority to expend (240500-261800 May).

Unit	Total	155-mm/ MK_/_ _KT	8-in/MK_/_ _KT	8-in/MK_/_ _KT	HJ/MK_/_ _KT	Air delivered MK_/_ _KT	MK_/_ _KT
10th Inf Div (Mech)	12	2	1	1	6	1	1
1st Bde	5	3	1	1			
2d Bde	3	2	1				
3d Bde	2	2	0				
Total	22	9	3	2	6	1	1

(3) Miscellaneous. Appendix 6 (Nuclear Fire Support).

g. Coordinating Instructions.

(1) FSCL is RED River eff 240700 May.

(2) Counterbattery status is active. Criteria to be announced.

(3) Maximum ordinate of artillery fires and naval gunfire in Area BRAVO from 240800 to 241200 May is 5,000 meters.

(Classification)

(Classification)

(4) Target BF2003 to be fired by NGF only if not positively destroyed by air or in event air support is not available.

(5) Notification of intent to fire to div FSE on all nuclear strikes NLT 25 minutes prior to TOT.

(6) On-call VX fires may be used to restrict movement and to interdict routes of enemy movement.

4. SERVICE SUPPORT

a. Div ADMINO 19.

b. ASR (240600-260600 May).

155-mm how 110

8-inch how 60

40-mm gun 250

c. ASP locations.

(1) ASP 10, 972651.

(2) ASP 11, 982511.

d. SASP locations.

(1) SASP 100, 970650.

(2) SASP 110, 981510.

e. Resupply of special ammunition per div SOP.

f. Special ammunition load (SAL).

Unit	Total	HE	155-mm/ MK___/ ___KT	8-in/ MK___/ ___KT	8-in/ MK___/ ___KT	HJ/MK___/ ___KT	M91 ripples GB/VX	Chemical GB/VX
1-2 FA	754	0	4	0	0	0	2/2	500/250
1-4 FA	754	0	4	0	0	0	2/2	500/250
1-6 FA	754	0	4	0	0	0	2/2	500/250
1-18 FA	475	0	4	4	2	0	0	
155-mm								270/135
8-in								40/20
1-20 FA	19	3		0	0	12	0	4/0
Total	2756	3	16	4	2	12		1814/905

Note. Totals do NOT include M91 ripples.

5. COMMAND AND SIGNAL

a. Signal.

(1) SOI, Index 1-66, eff 232400 May.

(2) Air coordinator call sign is THUNDER 12.

(3) Notification of intent to fire to Div FSE on all nuclear strikes except 155-mm/MK___/___KT NLT 25 minutes prior to TOT.

(4) Code word for cancellation of nuclear strike is CANCELED followed by nuclear target number.

(5) Annex D (Signal).

b. Command.

(1) FSE located at div CP.

(2) Div arty CP, 8633.

(Classification)

(Classification)

Acknowledge.

SMITH
MG

OFFICIAL:

/s/Burke
BURKE
G3

Appendixes: 1—Air Fire Support
2—Artillery Fire Support
3—Air Defense Artillery Fire Support (omitted)
4—Chemical Fire Support
5—Naval Gunfire Support
6—Nuclear Fire Support
7—Illumination Support

Distribution: A

Naval Fire Support Unit Two (TU 34.1.2)
9th TAF

(Classification)



APPENDIX F

AIR FIRE SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
232330 May 19__
CW 330

Appendix 1 (Air Fire Support) to Annex C (Fire Support) to OPORD 25
Reference: Map, GERMANY, 1:50,000, Sheets, 278, 279, 308, 309, 338
and 339.

1. GENERAL

Available air support will neutralize enemy reserves, artillery, and defensive positions; provide close air support for helicopter operations; and conduct armed reconnaissance of air routes RED, WHITE, and BLUE.

2. ALLOCATIONS

- a. Estimated 100 sorties available.
- b. Four aircraft available for combat air patrol for helicopter-landed 1-35 Inf for 4-hour period commencing 240800 May.
- c. Air Force personnel allocation (TACP).
 - (1) Division—One.
 - (2) Brigades—One each.
 - (3) Maneuver battalions—One each.
 - (4) Air coordinator call sign is THUNDER 12 (available through TASE during period of air-landed operations).

3. MISCELLANEOUS

- a. Coordinating instructions.
 - (1) FSCL is RED River.
 - (2) All returning aircraft will use reconnaissance routes RED, WHITE, and BLUE.
- b. Air safety.
 - (1) Current aircraft identification system in effect.
 - (2) Maximum ordinate of artillery fires is 5,000 meters in Area BRAVO from 240800 May to 241200 May.
- c. Chemical fires. Appendix 4 (Chemical Fire Support).
- d. DASC located at corps CP.

Acknowledge.

McMANNERS
MG

(Classification)

(Classification)

OFFICIAL:

/s/Higgins
HIGGINS
G3

Tabs: A—Preplanned Close Air Support Missions
B—Target Overlay No 1

Distribution: A
9th TAF

(Classification)

(Classification)

Tab A (Perplanned Close Air Support Missions) to Appendix 1
(Air Fire Support) to Annex C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Ground mission number	(c) Description	(d) Location	(e) Size		(f) Attitude (degrees)	(g) Sorties and armament	(h) TOT	(i) Control	(j) Remarks and/or results desired
1	BF2003	10-04-24	Tunnel entrance	822893	20		135	4 acft, load 1	H-15	Req FL control	Destroy. Req spot report.
2	BZ2011	10-05-24	Inf company	865888	200	400	105	4 acft, load 5	H-1	Req FL control	Neutralize. Req spot report.
3	BZ2021	10-06-24	Tk company assy area	930820	400	500	35	3 acft, load 5	H-15	Req FL control	Neutralize. Req spot report.
*		*	*		*		*	*			*
8	BZ2035	10-11-24	Concrete bridge	806795			75	4 acft, load 1	On call	TBA	Destroy.
9	BZ9029	10-12-24	Sus assy area	930780	1200			3 acft, load 10	On call	TBA	Contaminate entire area. Arty will mark.
10	BZ9030	10-13-24	Sus assy area	796822	1200			3 acft, load 10	On call	TBA	Contaminate entire area.
11	BZ9031	10-14-24	Sus assy area	815819	2300	500	105	2 acft, spray VX	On call	TBA	Contaminate entire area.

(Classification)

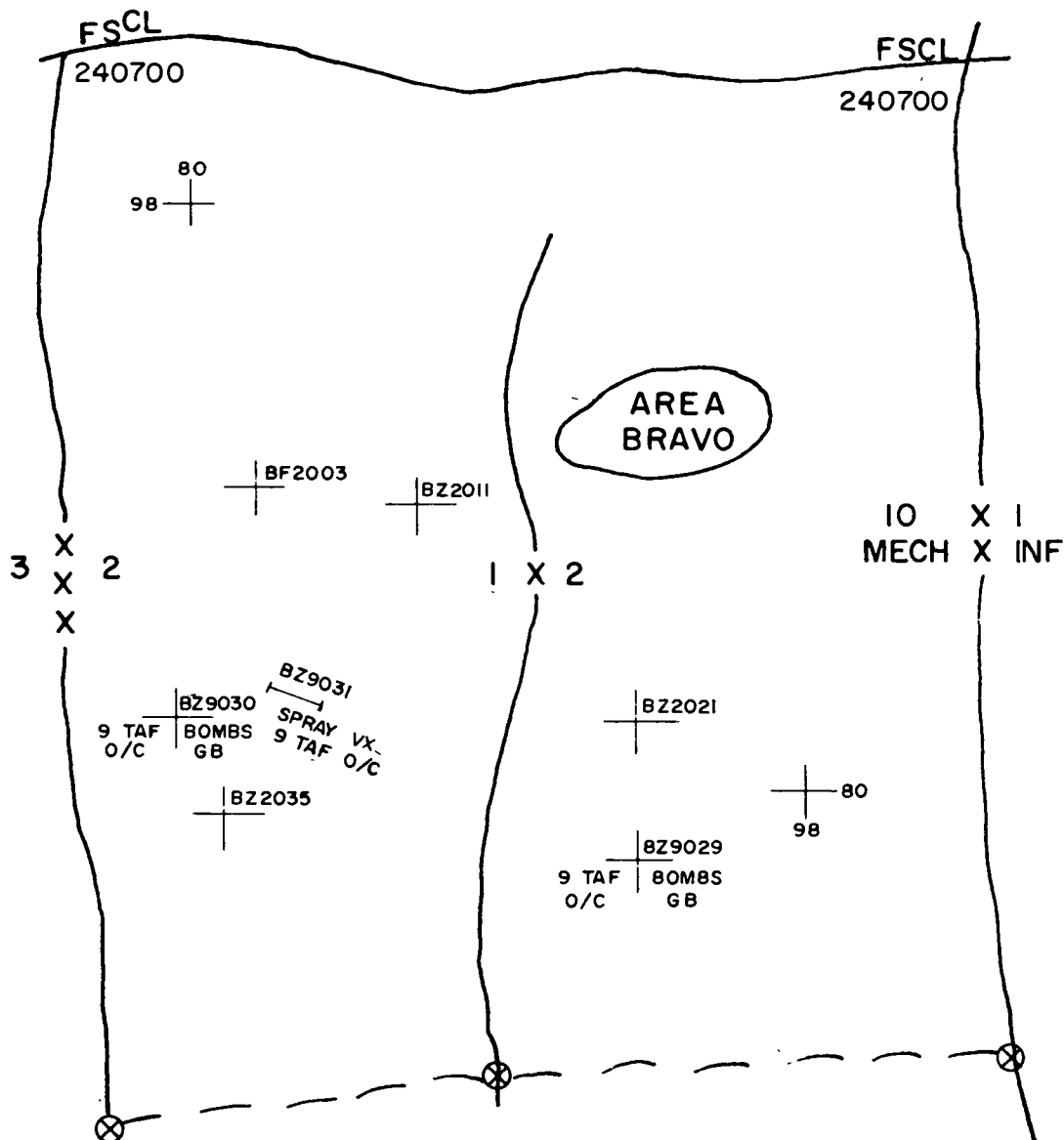
(Classification)

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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 1 (Air Fire Support) to Annex C
(Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)

APPENDIX G

ARTILLERY FIRE SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
232330 May 19__
CW 330

Appendix 2 (Artillery Fire Support) to Annex C (Fire Support) to OPORD 25.

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

1. The 35-minute combined special and conventional ammunition preparation fire will commence at H - 25.
2. Organization for combat.
 - 1-2 FA : DS 1st Bde.
 - 1-4 FA : DS 2d Bde.
 - 1-6 FA : GSR 1-2 FA ; o/o DS 3d Bde.
 - 1-18 FA : GS ; o/o GSR 1-6 FA.
 - 1-20 FA : GS.
3. ASR (240500-261800 May).

155-mm how	110
8-inch how	60
4. Special ammunition (HE).
 - a. Authority to expend. Honest John, eight rounds.
 - b. SAL. Honest John, three rounds.
5. Priority of fires to 1st Bde initially ; o/o priority to 3d Bde.
6. The counterbattery status is active.
7. NFL is indicated in tab B. All changes must be disseminated immediately.
8. All observation posts will be attacked by a mixture of smoke and HE.
9. Maximum ordinate of artillery fires in Area BRAVO is 5,000 meters from 240800 to 241200 May.
10. ASP locations.
 - a. ASP 10, 972651.
 - b. ASP 11, 982511.

(Classification)

(Classification)

Acknowledge.

SMITH
MG

OFFICIAL:
/s/Middleton
MIDDLETON
G3

Tabs: A—Target List No 1
B—Target Overlay No 1
C—Artillery Fire Support Table No 1
D—Artillery Fire Support Table No 2

Distribution: A

(Classification)

(Classification)

Tab A (Target List No 1) to Appendix 2 (Artillery Fire Support) to Annex C (Fire Support) to OPORD 25
Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 4

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size		(f) Attitude	(g) Source a/o accuracy	(h) Remarks	P r e P	G P				
1	BY8002	2 100-mm guns	88077616	481	100	50	1600	PI-100	Scd	X					
2	BY8003	Unk no 152-mm guns-how	90547523	398				PW-150	Scd	X					
3	BY8004	3 152-mm guns-how	91017703	345	200	150	1150	PI-100	Scd	X					
4	BY8005	Unk no 203-mm guns-how	89647987	378				RR-50	Scd, B1Y	X	X				
5	BY8006	2 140-mm rkt lchr	84167593	337	225	125	1200	PI-100	Scd	X					
6	BY8007	Unk no 210-mm rkt lchr	84287833	402				PW-150	Scd	X					
7	BY8008	Unk no medium guns-how	89207078	365				Z(g)-100	Scd, B1Y	X	X				
8	BY8009	Unk no 203-mm guns-how	80037650	393				RR-50	Scd, B2Y	X	X				
9	BY8010	Unk no 203-mm guns-how	80567725	351				RR-50	Scd, B2Y	X	X				

(Classification)

(Classification)

FM 6-20-2

Sheet 4 of 4

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size		(f) Attitude	(g) Source a/o accuracy	(h) Remarks	P r e P	G P				
*	*	*	*	*				*	*						
*	*	*	*	*				*	*						
*	*	*	*	*				*	*						
50	BF1123	Def pos	98657518	398	325	250	950	PI-100	Scd	X					
*	*	*	*	*				*	*						
53	BG2053	Def pos	97538119	391	350	300	725	PI-100	Scd	X					
54	BZ9029	Sus assy area	930780	375	1200				On call mark with WP						

(Classification)

(Classification)

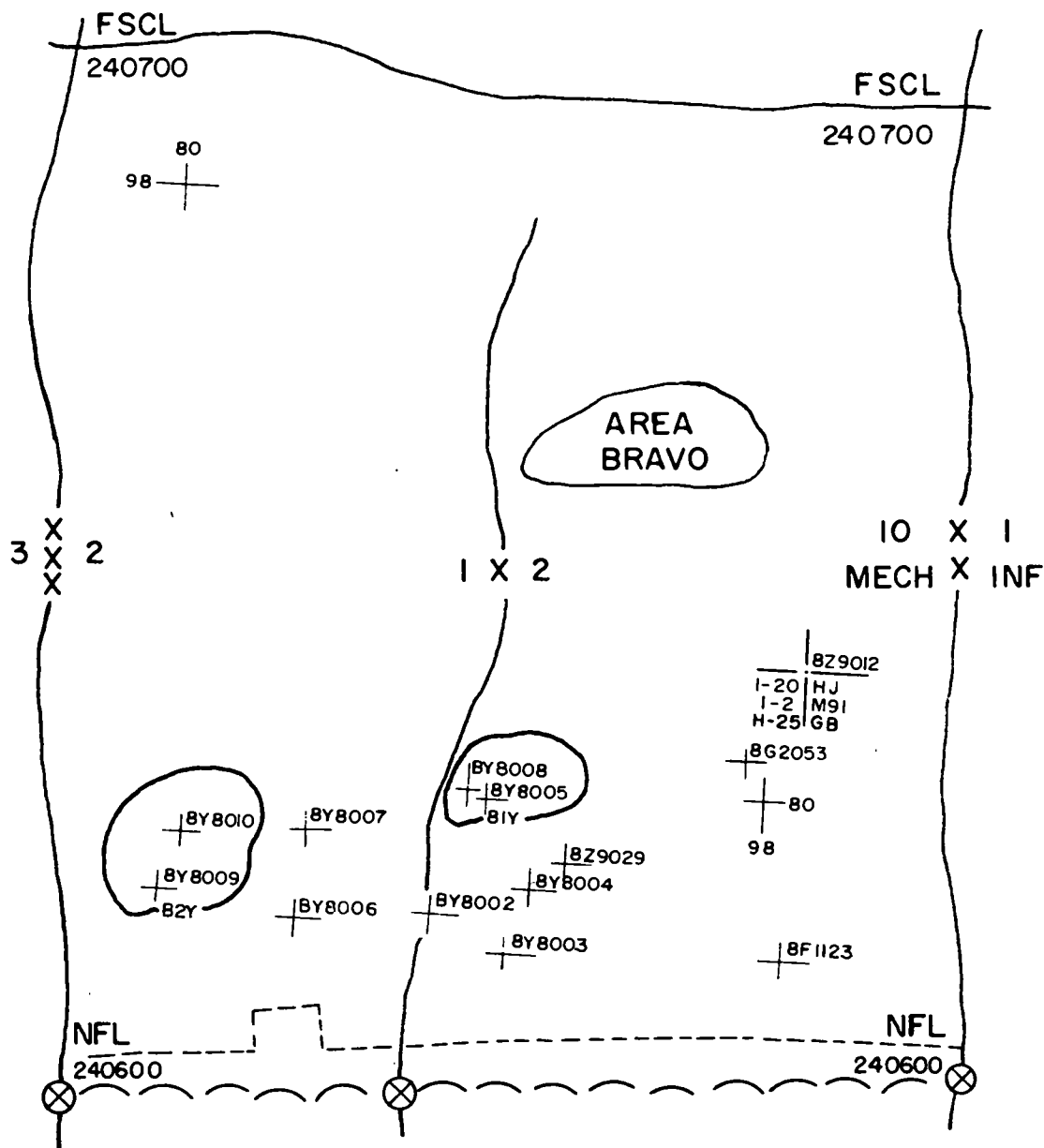
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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 2 (Artillery Fire Support) to

Annex C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)

Tab C (Artillery Fire Support Table No 1) to Appendix 2
(Artillery Fire Support) to Annex C (Fire Support) to OPORD 25

Sheet 1 of 2

PREPARATION FIRE

	(a)	(b)	(c)															(d)	(e)
Line no	Organization or formation	Firing unit	Scheduled targets															On-call targets	Remarks
			—25	—14	—12	—10	—8	—6	—4	—2	H	2	4	6	8				
1	1-2	A	BZ9012 (a)																(a) TOT H—25 M91 2 ripples GB
*		*				*			*				*		*		*		
6	1-6	A				BY8007 24		BY8005 24		BF1121 72		BY8002 24		BF1123 72					
7	1-6	B				BY8007 24		BY8005 24		BF1121 72		BY8002 24		BF1123 72					
8	1-6	C				BY8007 24		BY8011 18		BF1121 72		BY8007 12		BF1123 72					
9	1-18	A		BZ9012 18(b)		BY8009 24		BY8008 24		BG2052 60		BY8004 42		BG2058 60					(b) TOT H—15
10	1-18	B		BZ9012 18(b)		BY8009 24		BY8008 24		BG2052 60		BY8004 42		BG2053 60			BZ9029 (c)		(c) 2 rounds WP
11	1-18	C		BZ9012 18(b)		BY8009 24		BY8008 24		BG2052 60		BY8006 42		BG2053 60					
12	1-18	D		BZ9012 18(b)		BY8009 24		BY8003 9		BG2052 15		BY8006 15		BG2058 15					

(Classification)

Tab D (Artillery Fire Support Table No 2) to Appendix 2
(Artillery Fire Support) to Annex C (Fire Support) to OPORD 25

Sheet 1 of 1

GROUPS OF TARGETS

	(a)	(b)	(c)											(d)	(e)
Line no	Organization or formation	Firing Unit	B1Y	B2Y								On-call targets		Remarks	
1	1-6	A	BY8005												
			18												
2	1-6	B	BY8005												
			18												
3	1-6	C													
4	1-18	A	BY8008		BY8009										
			18												
5	1-18	B	BY8008		BY8009										
			18												
6	1-18	C			BY8010										
7	1-18	D			BY8010										

(Classification)



APPENDIX H

CHEMICAL FIRE SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
23220 May 19__
CW 330

Appendix 4 (Chemical Fire Support) to Annex C (Fire Support) to OPORD 25

Reference: Map, Germany, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

1. **SITUATION**

- a. Enemy forces. Annex A (Intelligence) to OPORD 25.
- b. Friendly forces. Annex C (Fire Support) to OPORD 25.

2. **MISSION**

Fire support agencies will employ lethal chemical agents on enemy forward defensive positions to assist in the penetration.

3. **EXECUTION**

- a. Concept of chemical support.

(1) A 5-minute chemical preparation will be fired from H-25 to H-20.

(2) On-call VX fires may be used to restrict movement and to interdict routes of enemy movement.

(Classification)

(Classification)

b. Authority to expend (240600-260600 May).

Ln no	Column									
	1	2	3	4	5	6	7	8	9	10
A	System	155-mm how		8-in how		HJ	M91 ripples		Air (bomb)	
B	Weapon	GB	VX	GB	VX	GB	GB	VX	GB	
C										
D	10th Inf Div (Mech)	800	600	80	40	8	6	6	224	
E	1st Bde	600	300				2	2	32	
F	2d Bde	600	300				2	2	32	
G	3d Bde	500	300				2	2	32	
	Total	2500	1500	80	40	8	12	12	320	

c. Units to participate in chemical fires. See tab A.

d. Coordinating instructions.

(1) Weather.

(a) Wind speed and direction, 4 mph, SW.

(b) Average temperature, 50° F.

(c) Conditions favor our use of chemical agents.

(2) Troops entering toxic impact areas will be masked initially.

(Classification)

(Classification)

4. SERVICE SUPPORT

- a. Div ADMINO 19.
b. SAL.

Ln no	Column							
	1	2	3	4	5	6	7	8
A	System	155-mm how		8-in how		HJ	M91 ripples	
B	Weapon	GB	VX	GB	VX	GB	GB	VX
C								
D	1-2 FA	500	250				2	2
E	1-4 FA	500	250				2	2
F	1-6 FA	500	250				2	2
G	1-18 FA	270	135	40	20			
H	1-20 FA					4		
Total in div dlvr units		1770	885	40	20	4	6	6

c. SASP locations.

- (1) SASP 100, 970650.
(2) SASP 110, 981510.

5. COMMAND AND SIGNAL

Annex D (Communications-Electronics) to OPORD 25.

Acknowledge.

EVANS
MG

OFFICIAL:
/s/McMakin
McMAKIN
G3

Tabs: A—Fire Support Table/Target List No 1
B—Target Overlay No 1

Distribution: A
2d Corps
9th TAF

(Classification)

Tab A (Chemical Fire Support Table/Target List No 1) to Appendix 4
 (Chemical Fire Support) to Annex C (Fire Support) to OPORD 25
 Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location/ DGZ	(d) Altitude	(e) Size		(f) Attitude	(g) Weapon/ ammunition	(h) TOT	(i) Unit	(j) HOB	(k) Remarks and/or results desired
					L	W						
1	BF9001	Inf assy area	818799	330	3300	1800	750	2 sorties, 12 bombs, GB	H-25	9 TAF		Immediate casualties
2	BZ9012	Def position	980830	415	2400	600	2100	2 HJ, GB 3 M91 GB	H-25	1-20 FA 1-2 FA		Immediate casualties
3	BZ9013	Def position	948847	260	400	600	1650	2 sorties, 16 bombs GB	On call	9 TAF		Immediate casualties
*		*	*	*				*	*			*
8	BZ9028	Def position	918420	280	400	700	2200	1 HJ GB	On call	1-20 FA		Immediate casualties
9	BZ9029	Sus assy area	980820	320	1200			3 sorties, 48 bombs GB	On call	9 TAF		Immediate casualties
10	BZ9030	Sus assy area	796822	290	1200			3 sorties, 48 bombs GB	On call	9 TAF		Immediate casualties
11	BZ9031	Sus assy area	815819	305	2300	500	1850	2 sorties, spray VX	On call	9 TAF		Contaminate entire area

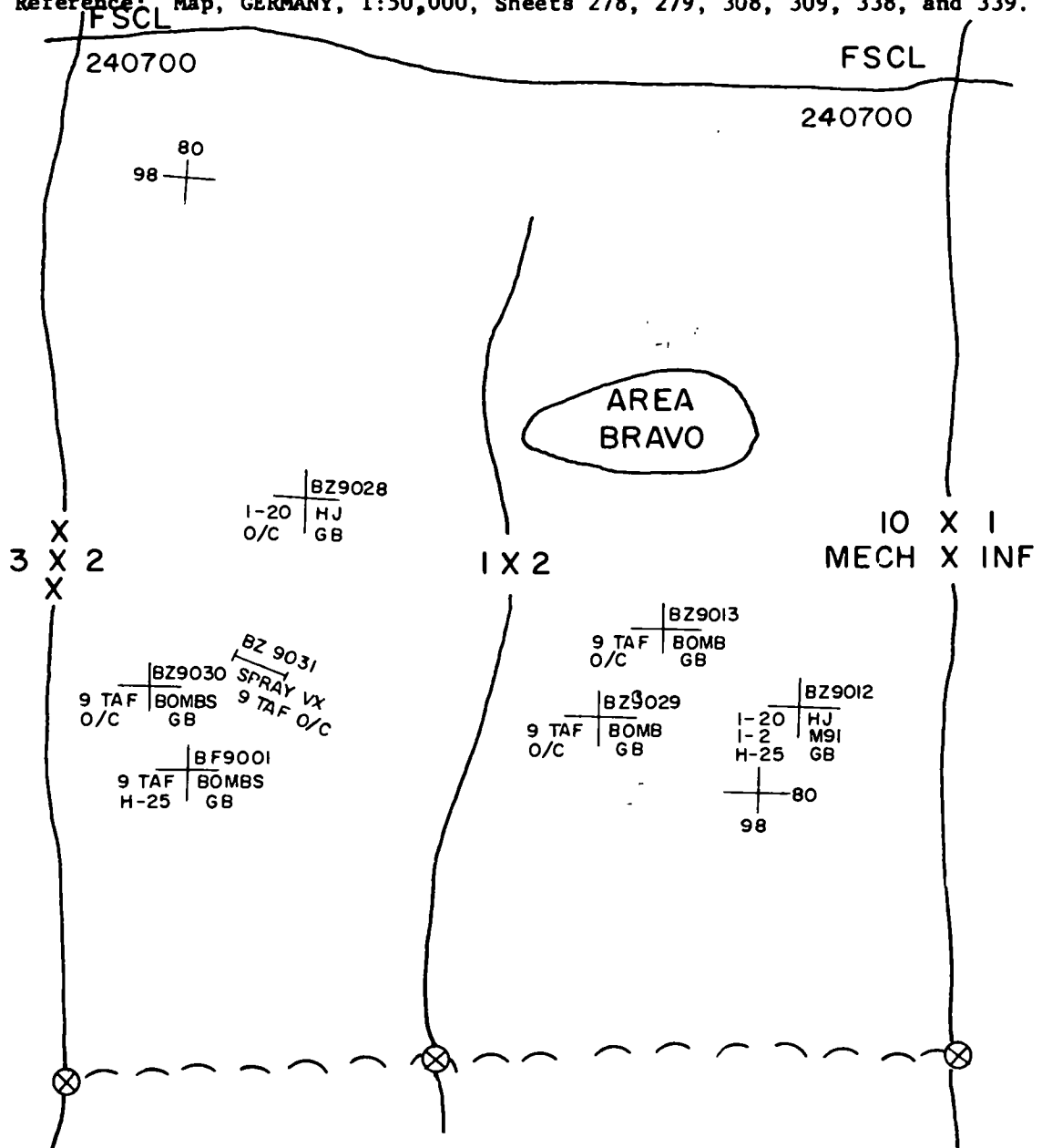
(Classification)

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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 4 (Chemical Fire Support) to Annex
C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)



APPENDIX I

NAVAL GUNFIRE SUPPORT APPENDIX

(Classification)

Copy No. 2

10th Inf Div (Mech)

BREMERHAVEN (8835), GERMANY

232330 May 19__

CW 330

Appendix 5 (Naval Gunfire Support) to Annex C (Fire Support) to OPOD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

1. See Target Overlay No 1 for fire support areas (FSA), zone of fire (ZF), no-fire line (NFL), and naval gunfire (NGF) targets.
2. On-call neutralization fires will be observed and adjusted whenever possible.
3. TOT's fired by NGF ships and artillery units will be coordinated through the FSCC/FSE and other appropriate supporting arms control agencies.
4. Air target BF1003 is duplicated within capability of NGF support means. To be fired only if not positively destroyed by air attack or in the event air support is not available.
5. Artillery FO's will request NGF missions through FSCC of supported battalion by most expeditious communication means. NGF liaison officer and spotters will be prepared to relay such requests.
6. Trajectory limitations will be announced through FSCC channels.

(Classification)

(Classification)

Acknowledge

EVANS
MG

OFFICIAL:

/s/Brown
BROWN
G3

Tabs: A—Target List No 1
B—Target Overlay No 1
C—Naval Gunfire Support Table

Distribution: A
Naval Fire Support Unit Two (TU 34.1.2)

(Classification)

(Classification)

Tab A (Target List No 1) to Appendix 5 (Naval Gunfire Support) to Annex C (Fire Support) to OPORD 25
Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size		(f) Attitude	(g) Source a/o accuracy	(h) Remarks	P r e p	G P					
1	BF1203 (ZR 7)	Tunnel ent	822893	150	20		2400		Airstrike H-20							
2	BF1220 (ZR 4)	Plt def pos	851805	170	80			PI		X						
3	BF1221 (ZR 7)	Tk assy area	824875	140	200			AO, PI		X						
*	*	*		*			*	*	*							
8	BF1226 (ZR 1)	Plt def pos	816881	180	125			Patrol		X						
9	BF1227 (ZR 7)	Lt acft landing fld	876848	120	900	50	0400	AO, PI 50								
10	BF1228 (ZR 7)	Regt CP	836835	180	250			PW		X						
*	*	*		*			*	*	*							
25	BF1201 (ZR 3)	ASP	894790	205	200	150	100	AOP, PI		X						
26	BG1202 (ZR 4)	Co (-) def pos	993795	100	200	100	1850	AOP		X						
27	BG1203 (ZR 3)	Def pos	889802	170	250	150	1400	PI		X						
28	BG1204 (ZR 3)	Tk assy area	906787	180	400	300	1750	AO		X						
*	*	*		*			*	*	*							
48	BG1217 (ZR 8)	Sus CP	937822	150	100			PI		X						
49	BG1218 (ZR 8)	Res assy area	948812	160	200			AO		X						
50	BG1219 (ZR 8)	Earth bunkers	920810	200	150	100	1600	PI		X						

(Classification)

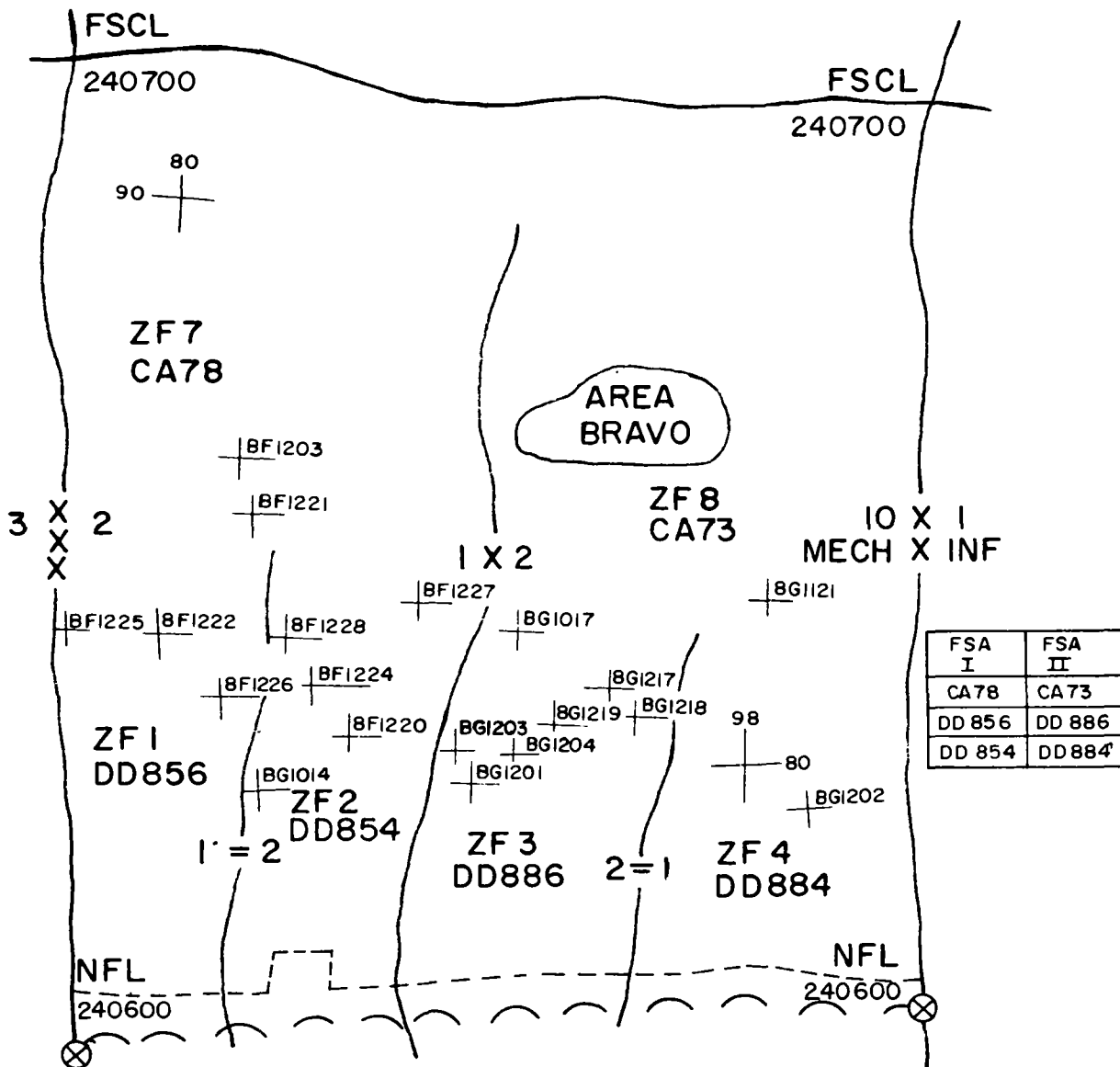
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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 5 (Naval Gunfire Support) to
Annex C (Fire Support) to OPOD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)

(Classification)

Tab C (Naval Gunfire Support Table) to Appendix 5
(Naval Gunfire Support) to Annex C (Fire Support) to OPORD 25

Sheet 1 of 1

Line no	(a) Organization or formation	(b) Firing unit	(c)														(d) On-call target	(e) Remarks
			-20	-18	-16	-14	-12	-10	-8	-6	-4	-2	H	2	4	6		
			BG1201				BG1203			BG1219		BG1218						
1	CA73 (ZF 8)	8-in	18(a)				18(a)			24		24(b)					BG1017, BG1121	(a) Fz mixed (b) Fz mixed, air spot
2		5-in		BG1201														
			18															
3	DD886 (ZF 3)	5-in								BG1203								
										24								
4	DD884 (ZF 4)	5-in	BG1202				BG1204										BG1014	
			24				48(a)											
5	CA78 (ZF 7)	8-in			BF1228												BF1203, BF1227	
					24													
6		5-in	BF1221															
			18															
7	DD856 (ZF 1)	5-in	BF1226														BF1222(b)	
			24															
8	DD854 (ZF 2)	5-in	BF1220															
			18														BF1224	

(Classification)



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3

APPENDIX J

NUCLEAR FIRE SUPPORT APPENDIX

Classification

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
232000 May 19__
CW 330

Appendix 6 (Nuclear Fire Support) to Annex C (Fire Support) to
OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338,
and 339.

1. GENERAL

a. Twenty-two nuclear weapons authorized for expenditure by the
10th Inf Div (Mech) during the operation.

b. Nuclear preparation will be fired from H-25 to H-20.

2. AUTHORITY TO EXPEND (240500-261800 May).

Unit	Total	155-mm MK__/ __KT	8-in/MK__/ __KT	8-in/MK__/ __KT	HJ/MK__/ __KT	Air delivered MK__/_KT MK__/_KT	
Div	12	2	1	1	6	1	1
1st Bde	5	3	1	1			
2d Bde	3	2	1				
3d Bde	2	2	0				
Total	22	9	3	2	6	1	1

(Classification)

(Classification)

3. SAL

Units	Total	155-mm/MK___/ ___KT	8-in/MK___/ ___KT	8-in/MK___/ ___KT	HJ/MK___/ ___KT
1-2 FA	4	4			
1-4 FA	4	4			
1-6 FA	4	4			
1-18 FA	10	4	4	2	
1-20 FA	12				12
Total in div dlvr units	34	16	4	2	12

4. MISCELLANEOUS

a. Nuclear target number allocations.

10th Inf Div (Mech)	1000-1039
1st Bde	1040-1059
2d Bde	1060-1079
3d Bde	1080-1099

b. Notification of intent to fire to div FSE on all nuclear strikes except SRC/ALFA/0.5-KT, NLT 25 minutes prior to TOT.

c. Nuclear weapons will not be employed—

(1) Against populated areas of over 2,000 population when the effects will exceed a degree of risk equivalent to moderate risk to warned, exposed personnel.

(2) Against historical edifices, government buildings, and communications facilities without approval of FSE, this HQ.

d. Cancellation of nuclear strike. Notification to div FSE NLT 15 minutes prior to TOT. Code word for cancellation is CANCELED followed by nuclear target number.

e. For air-delivered nuclear strikes, allow 5-minute minimum separation time between multiple flights.

(Classification)

(Classification)

- f. Troop safety. SOP.
- g. Reports. SOP.
- h. SASP locations.
 - (1) SASP 100, 970650.
 - (2) SASP 110, 981510.

Acknowledge.

EVANS
MG

OFFICIAL:
/s/Chapman
CHAPMAN
G3

Tabs: A—Nuclear Fire Support Table/Target List No 1
B—Target Overlay No 1

Distribution: A
+

(Classification)

Tab A (Nuclear Fire Support Table/Target List No 1) to Appendix 6
 (Nuclear Fire Support) to Annex C (Fire Support) to OPORD 25
 Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location/ DGZ	(d) Altitude	(e) Size	(f) Attitude	(g) Weapon/ munition	(h) TOT	(i) Unit	(j) HOB	(k) Remarks and/or results desired
1	CY1000	CP complex	95809890	380	400		HJ —KT	H-20	A/1-20	LA	FP2
2	CA1040	Tk co assy area	88908425	320	400		8-in —KT	H-18	D/1-18	LA	Move one how to vic grid 88007300 to fire.
3	CB1060	Mech plt	91788225	370	150		8-in —KT	H-16	D/1-18	LA	

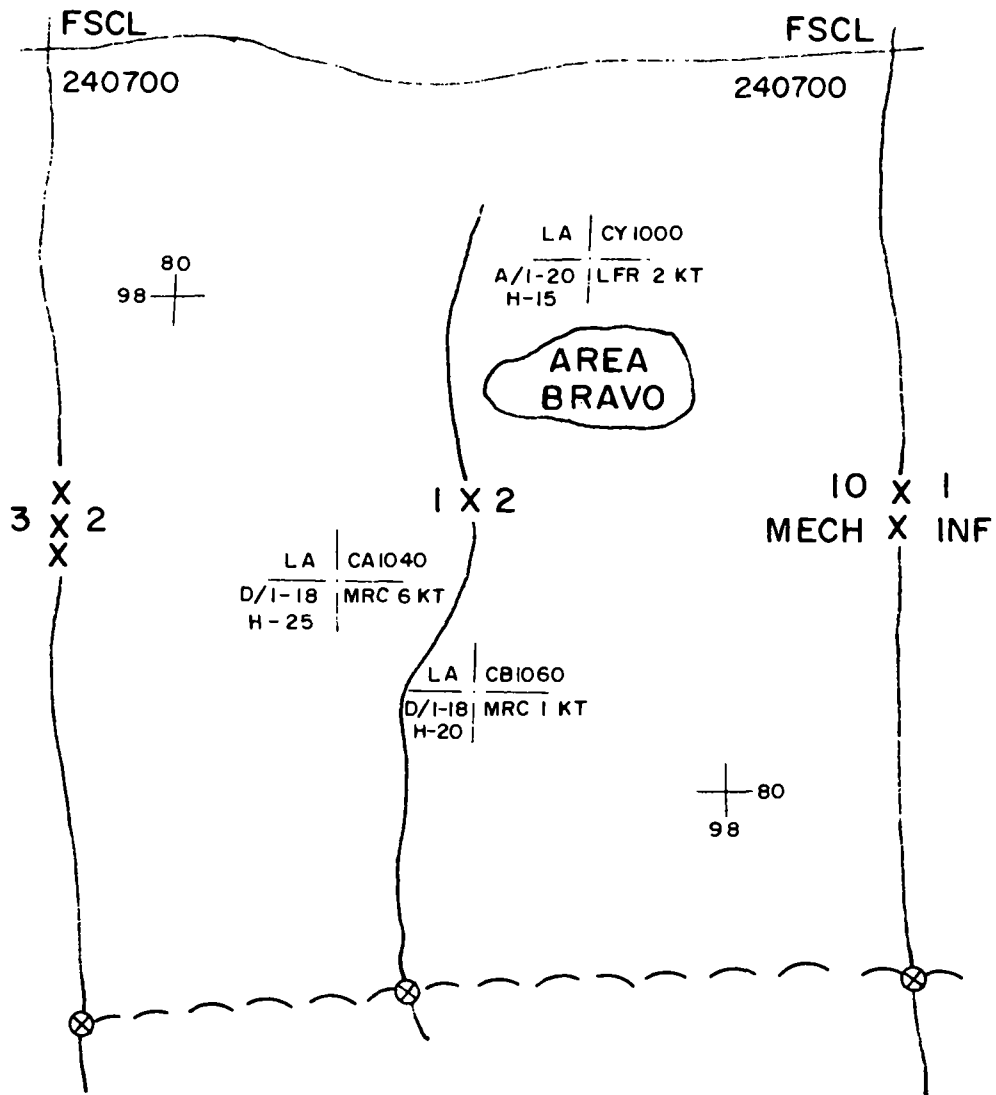
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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 6 (Nuclear Fire Support) to Annex
C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)



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APPENDIX K

ILLUMINATION SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
241330 May 19__
CW 330

Appendix 7 (Illumination Support) to Annex C (Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

1. 10th Inf Div (Mech) will conduct a supported, illuminated night attack commencing 242230 May.
2. Illumination during the preparation will start at H-10 and continue after H-hour. Illumination to be provided by searchlights, artillery, naval gunfire, and tactical air.
3. Organization for preplanned illumination.
 - a. Searchlight. 1st Plt (Reinf), Btry A (Slt), 37th FA: DS 10th Inf Div (Mech).
 - b. Air. 9th TAF: Provide four illumination aircraft (Msn No 10-06-24 and 10-12-24).
 - c. Artillery. 1-2 FA: DS 1st Bde. 1-4 FA: DS 2d Bde. 1-6 FA: GSR 1-2 Arty.
 - d. Naval gunfire. TU 34.1.2 (CA78): GS 10th Inf Div (Mech).
4. 1st Plat (Reinf), Btry A (Slt), 37th FA, be prepared to provide illumination on other targets as directed; LDC to be established at HE8035.
5. Priority of illumination to 1st Bde.
6. All fire support agencies be prepared to furnish additional illumination on order.
7. Illumination ASR for period 241200-251200 May. 155-mm how-20.
8. Weather forecast disseminated per division SOP.

Acknowledge.

(Classification)

(Classification)

HAIR
MG

OFFICIAL:

/s/Lopez
LOPEZ
G3

Tabs: A—Target List No 1
B—Target Overlay No 1
C—Illumination Support Table No 1

Distribution: A
9th TAF
Naval Fire Support Unit Two (TU 34.1.2)

(Classification)

(Classification)

Tab A (Target List No 1) to Appendix 7 (Illumination Support)
to Annex C (Fire Support) to OPOD 25
Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size (diameter)	(f) Attitude	(g) Source a/o accuracy	(h) Remarks	P r e p	c O a n l			
1	BF1288	Regimental CP	886885	180	500		PW	NGF, one gun	X				
2	BY1006	Defensive position	822781	415	1000		P1	Slt, full-beam spread, indirect, visible illum	X				
3	BY1007	Defensive position	888763	402	1000		PW	Slt, full-beam spread, indirect, visible illum	X				
4	BY1008	Defensive position	858760	889	300		P1	Slt, pencil beam, indirect, visible illum	X				
5	BZ1001	Suspect CP	770749	875	500		PI	Slt, full-beam spread, direct, visible illum	X				
6	BZ1002	Suspect CP	805761	380	500		PI	Visible illum, Slt, pencil beam, direct	X				
7	BZ1003	Suspect CP	955756	882	100		AO	Visible illum, Slt, pencil beam, direct	X				
8	BZ1004	Road junction	820809	887	800		P1	Arty, two-gun spread		X			
9	BZ1005	Avenue of approach	843788	378	1500		PI	Arty, four-gun spread		X			
10	BZ2021	Tank company assembly area	980820	180	500		AO	TAF, MK 24 flare		X			
11	BZ1029	Suspect assembly area	980780	875	2400		PW	TAF, MK 24 flare		X			
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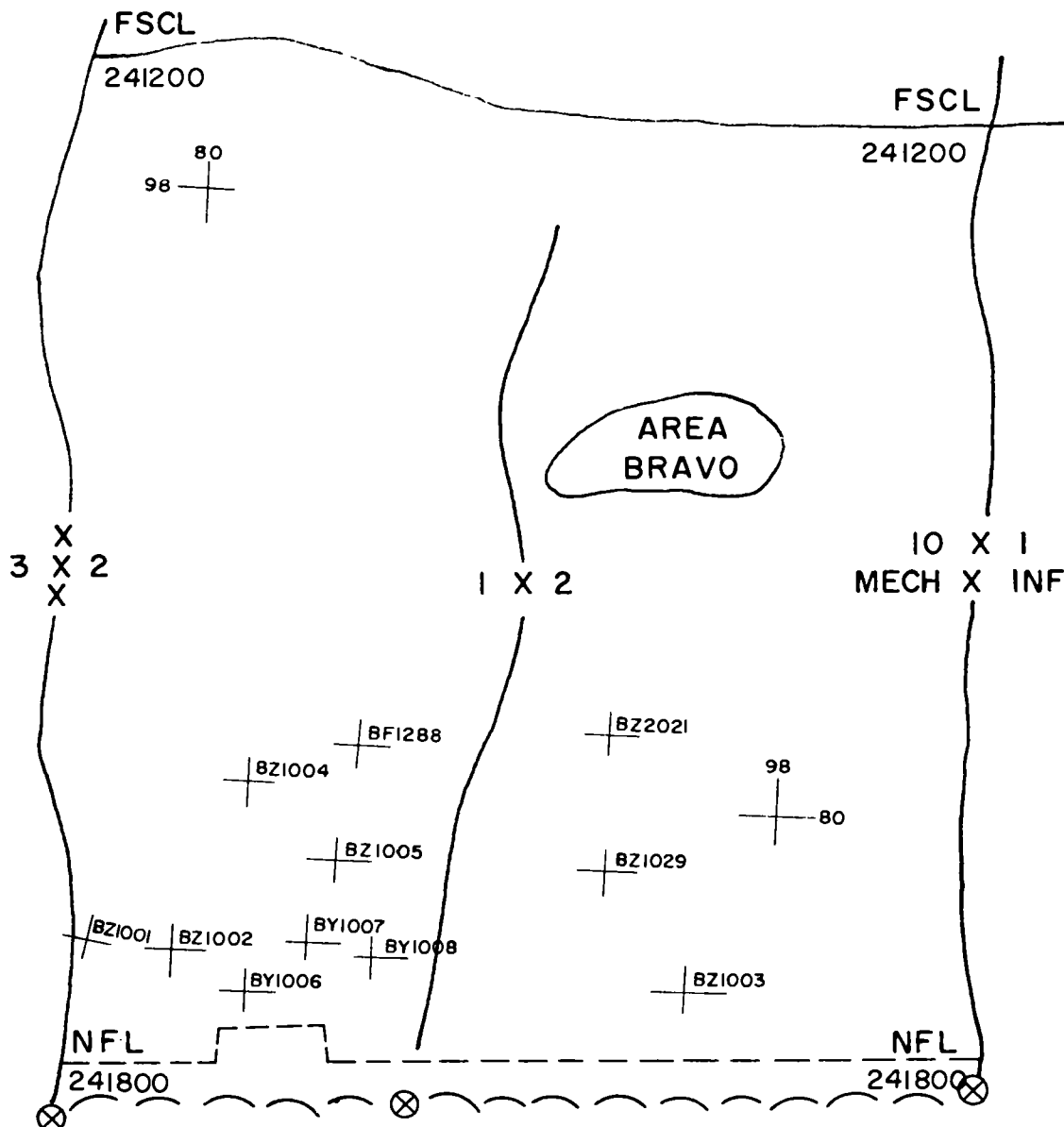
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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 7 (Illumination support) to Annex C
(Fire Support) to OPORD 25

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.



(Classification)

(Classification)

Tab C (Illumination Support Table No 1) to Appendix 7
(Illumination Support) to Annex C (Fire Support) to OPOD 25

Sheet 1 of 1

Line no	(a) Organiza- tion or formation	(b)	(c) Scheduled targets														(d) On-call targets	(e) Remarks
			-10	-8	-6	-4	-2	H	2	4	6	8	10	12	14	16		
1	1st Plt (Reinf)	1-1					22	minutes	(visible illum)									Be prepared to
2	Btry A (Slt)	1-2					20	minutes	(visible illum)									continue illumi- nation beyond cut time
3	37th FA	1-3					26	minutes	(visible illum)									
4		1-4					26	minutes	(visible illum)									
5		1-5					25	minutes	(visible illum)									
6		1-6					25	minutes	(visible illum)									
7	TG 27.6	CA78					8	minutes										One gun

(Classification)



(Classification)

[illegible]

FM 6-20-2



APPENDIX M

SMOKE SUPPORT APPENDIX

(Classification)

Copy No 2
2d Bde, 10th Inf Div (Mech)
BREMERHAVEN (9368), GERMANY
252200 May 19__
AY 365

Appendix 2 (Smoke Support) to Annex B (Fire Support) to OPORD 30
Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338,
and 339.

1. The 22-minute conventional ammunition preparation fire will commence at H-12.

2. Organization for combat.

1-4 FA: DS 1st Bde.

1-6 FA: Reinf 1-4 FA; o/o DS 2d Bde (not to exceed 40 percent HE ASR).

3. ASR (260001-282400 May).

	<u>HC</u>	<u>WP</u>	<u>Total</u>
155-mm how	85	100	185

4. Bn S4's will request and draw necessary HC and WP for immediate consumption prior to the preparation fire.

5. The counterbattery status is active.

6. NFL is indicated in tab B. All changes must be disseminated immediately.

7. ASP location, 10972651.

8. Targets attacked with HE and smoke munitions will be analyzed to achieve 10 percent HE casualties (enemy in defensive posture).

Acknowledge.

SPIGARELLI
COL

OFFICIAL:

/s/Poe

POE

G3

Tabs: A—Target List No 1

B—Target Overlay No 1

C—Artillery Fire Support Table No 1

Distribution: A

9th TAF

(Classification)

(Classification)

Tab A (Target List No 1) to Appendix 2 (Smoke Support) to
Annex B (Fire Support) to OPORD 30

Reference: Map, GERMANY, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size		(f) Attitude	(g) Source and/ or accuracy	(h) Remarks	P r e p	O n c a l l			
1	AG1121	Valley	95497265	380		500	1800		Smoke curtain	x				
2	AG1122	Inf plt strongpoint	96067356	469	325	300	1600	PI-100		x				
3	AG1123	Squad strongpoint	94647410	370	150	150		PW-150		x				
4	AG1124	OP	92527281	481				AOP-50	Obscuring smoke	x				
5	AG2101	Squad strongpoint	94667273	385	125	100	1400	PI-100		x				
6	AG2102	Two antitank weapons	95477227	437				Patrol-100		x				
7	AG2103	Inf plt dug in	95937205	445	300	100	1650	PI-1000		x				
8	AG2104	Two antiaircraft weapons	96757218	451				AOP-50	Smoke haze		x			
9	AG3091	Motorized plt assy area	91797343	426		300		PI-100		x				
10	AG3092	Inf plt dug in	91807238	429	150	150	1350	PI-100		x				
11	AG3093	Inf plt dug in	90617259	432	400	200	1500	AOP-50	Obscuring smoke	x				
12	AG3094	Plt strongpoint	01977358	411	R+90			PI-150	Obscuring smoke	x				
13	AG7061	Antiaircraft weapons	93347411	380		100		PI-100		x				

(Classification)

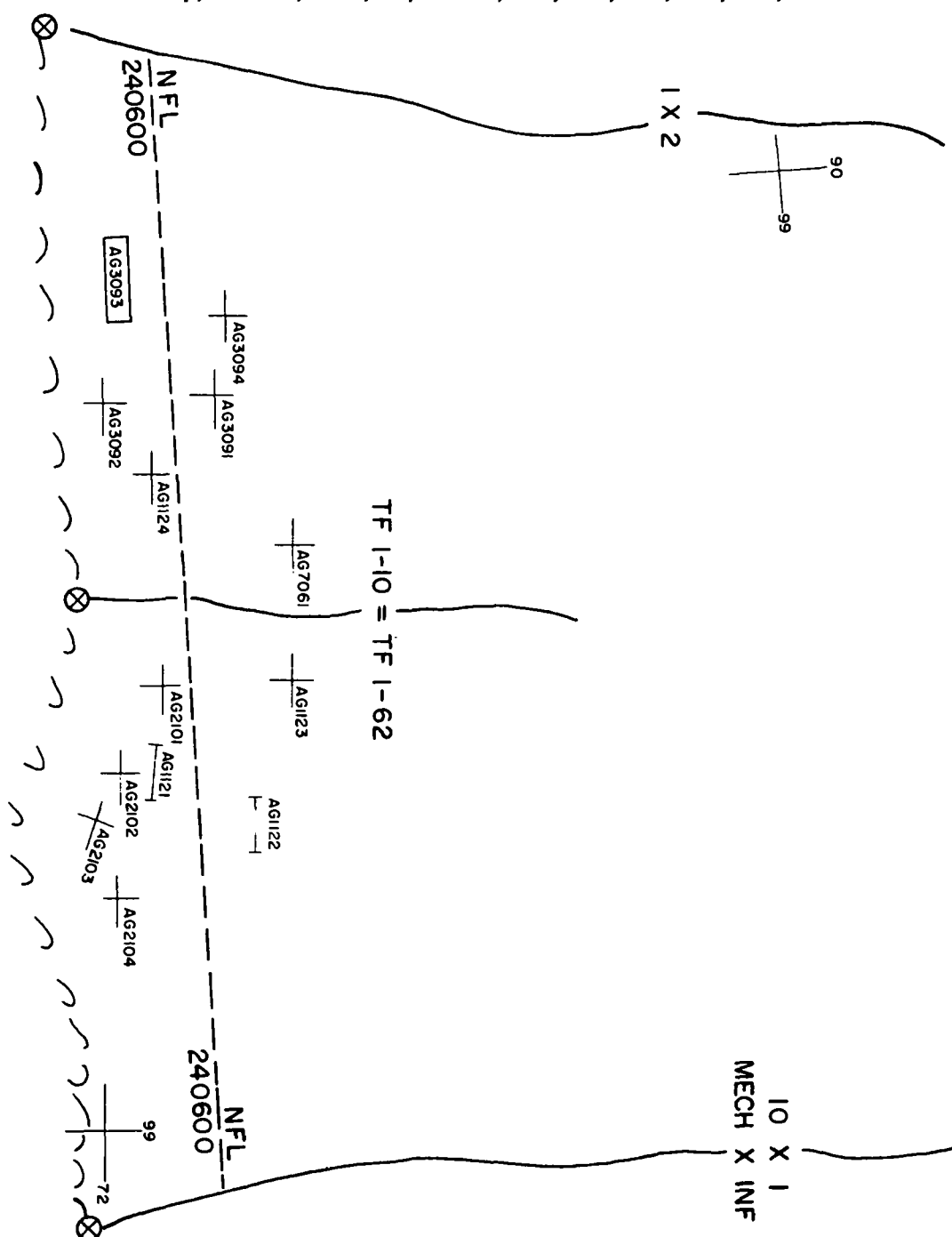
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Sheet 1 of 1

Tab B (Target Overlay No 1) to Appendix 2 (Smoke Support) to Annex B (Fire Support) to OPORD 30

Reference: Map, GERMANY, 1:50,000, Sheets, 278, 279, 308, 309, 338, and 339.



(Classification)

(Classification)

Tab C (Artillery Fire Support Table No 1) to Appendix 2
(Smoke Support) to Annex B (Fire Support) to OPORD 30

PREPARATION FIRE

Sheet 1 of 1

Ln no	(a) Organization or formation	(b) Firing unit	(c) Scheduled targets														(d) On-call targets	(e) Remarks
			-12	-10	-8	-6	-4	-2	H	2	4	6	8	10	12	14		
1	1-4 FA	A	AG7061	AG3092		AG1122		AG1123		AG1121							AG2104 (b)	(a) TOT H-5
			12	12		18 (a)		86		(d)								
2		B	AG7061	AG3092		AG1122		AG2101		AG1121								(b) HC & WP (50 percent mix)
			12	12		18 (a)		86		(d)								
3		C	AG2102			AG1122		AG1124										(c) WP & HE (30 percent mix)
			30			18 (a)		(b)										
4	1-6 FA	A	AG3091			AG2103		AG3093										(d) Smokescreen w/HC & WP (50 percent mix); lift on call
			30			18 (a)		(c)										
5		B	AG3091			AG2103		AG3094										
			30			18 (a)		(c)										

(Classification)

APPENDIX N

FIRE SUPPORT COORDINATION FORMS

Section I. GENERAL

The requirement for rapid decisions in order to effect appropriate fire coordination dictates the need for graphic display of information in the fire support coordination center (FSCC) and/or fire support element (FSE). The specific information required is determined by the fire support coordinator (FSCoord) operating the FSCC or FSE and is included in the standing operating procedures of the headquarters. In addition to situation maps, fire capabilities overlays, and planning maps for future operations, the forms in section II of this appendix serve as ready references for information that is required and used frequently.

Section II. EXAMPLE FORMS

Organization for Combat and Status of Units	<i>Form</i> N-1
Situation Report	N-2
Call for Fire from Higher Headquarters (Conventional)	N-3
Call for Fire from Higher Headquarters (Special Ammunition)	N-4
Fire Mission Record	N-5
Nuclear Target Analysis Form	N-6
Nuclear Fire Mission Summary	N-7
Nuclear Action Form Record	N-8
NBC Report Form	N-9
Tactical Damage Assessment Report	N-10
Allocation Summary (Special Ammunition)	N-11
Distribution Summary (Special Ammunition)	N-12
Daily Air Reconnaissance Plan Worksheet	N-13
Transport Helicopter Request Form	N-14
Airlift Request Form	N-15

Form N-1. Organization for Combat and Status of Units.

Units	Call sign		Present location		Time reported displaced	Proposed location		Time closed	Mission DS	Active		Readiness	Remarks
	Telephone	Radio	Clear	Coded		Clear	Coded			Tubes	Lchr		
1-3	SMOKER	ARTERY	320561	NA12B7	071310	290542	LF16A3		1st Bde	(18)			
A	SMOKER RED	ARTERY	291430	TL67G9	070600					6			
B	SMOKER WHITE	ARTERY	250367	MH1605	070900					6			
C	SMOKER BLUE	ARTERY	241478	PN76H4	070910					6			
1-10	CONGO	TOPEKA	300310	JO27F1	070800				GS	22	4		
101 Arty Gp	DAGWOOD	STUCCO	470819	AM27H7	061900				GSR 1st Div Arty	(60)			
2-50	BARREL	TANGO	410620	BX8016	070600					18			
3-51	JASON	PENNY	381962	DE10G6	061400					18			
4-70	SHAMROCK	CAESAR	320320	GH27A9	061500					12			
5-71	PERRY	SAPPHIRE	370512	XF98Z8	061000					12			
102 Arty Gp													
1-50													
2-51													
3-70													
4-71													
3-82												A ¹	

Note. Readiness conditions may be established in the standing operating procedures and are designated as follows:

A¹—1-minute notice required for firing.

Form N-2. Situation Report

1. Unit sending report: _____
(Radio or telephone call sign)
2. Period covered: From _____ to _____
(Date and time) (Date and time)
3. Location of forward elements of supported units: _____
IN CODE.
4. Location of unit CP and closing time: _____ IN CODE.
 - a. Locations of battery centers or firing positions for missile units:
 - (1) _____ (2) _____
 - (3) _____ (4) _____ IN CODE.
 - b. Direction of center of zone of fire: (1) _____
(2) _____ (3) _____
(4) _____ IN CODE.
 - c. Proposed new location and effective time: _____
IN CODE.
5. Location of unit helipad: _____ IN CODE.
6. No-fire line (location and effective time): _____
IN CODE.
7. Number of missions fired: _____ IN CLEAR.
8. Enemy casualties: _____ IN CLEAR.
9. Materiel destroyed: a. Type _____, b. Number _____
IN CLEAR.
10. Personnel losses: a. KIA _____, b. WIA _____
IN CODE.
11. Ammunition status: (ALL IN CODE)

Type	Rounds on hand	Rounds expended during period
a. HE	_____	_____
b. Smoke	_____	_____
c. Other	_____	_____
d. Total	_____	_____
12. Shortages of personnel, equipment, fuel, or ammunition that seriously affect unit mission: _____ IN CODE.
13. Combat efficiency as of end of period: _____
IN CODE.
14. Plans for support of future operations and incidents of immediate value. (Submit overlay when practicable.) _____
IN CODE.

Form N-3. Call for Fire from Higher Headquarters (Conventional)

The following is a list of the elements in a call for conventional fire from higher headquarters in the sequence in which they are transmitted:

1. Identification: _____, THIS IS _____.
2. Warning order/size of unit to fire: FIRE MISSION, _____.
3. Target location:
 - a. Target number _____.
 - b. Grid _____; altitude _____ meters.
 - c. Other _____.
4. Description of target:
 - a. Type _____.
 - b. Size _____.
 - c. Attitude _____.
 - d. Degree of protection _____.
5. Method of engagement: The elements in a through d below are transmitted if they are different from standard.
 - a. Type of engagement _____.
 - b. Type of trajectory _____.
 - c. Type of ammunition
 - (1) Type of shell/fuze _____.
 - (2) Volume to be fired _____.
 - d. Distribution of fire _____.
6. Method of fire and control: _____.

Implementing Instructions for Calls for Conventional Fire from Higher Headquarters

A format is required to enable divisional and higher artillery headquarters to forward calls for conventional fire to artillery battalions or to an intermediate artillery headquarters. The format for calls for conventional fire from higher headquarters is outlined below. This format may be used to request additional fires.

1. IDENTIFICATION

The initial element of the message, identification, establishes communication between the higher artillery headquarters and the fire unit or an intermediate artillery headquarters.

2. WARNING ORDER/SIZE OF UNIT TO FIRE

a. The basic warning order is FIRE MISSION.

b. This element includes a second element, which specifies the size of the fire unit(s) to fire for effect; e.g., BATTERY, BATTALION, ALL AVAILABLE.

3. TARGET LOCATION

a. The location of the target may be given in one of the following ways:

- (1) By target number and known point.
- (2) By grid.
- (3) By reference from a known point.
- (4) By polar coordinates.

b. The target number and known point are mutually known locations.

- (1) ZT1242.
- (2) AB1014.
- (3) REGISTRATION POINT 1.

c. Grid coordinates indicate the easting and northing to the degree of accuracy required by the type of engagement. Normally, the altitude is included as a second element. Example: GRID 42137856, ALTITUDE 231.

d. The target may be identified by reference from a known point, by polar coordinates, or by other means. Examples:

(1) From REGISTRATION POINT 1, DIRECTION 2610, LEFT 600, ADD 400, DOWN 20.

(2) ZT1234, DIRECTION 1200, RIGHT 400, DROP 200, UP 50.

(3) Direction 1240, DISTANCE 2000, UP 24 MILS.

Note. If meters or mils are not specified, elevation is assumed to be in meters.

4. DESCRIPTION OF TARGET

The description of the target is as complete as

possible and includes all information that may influence the engagement of the target. The following elements may be included:

a. The type of target; e.g., BATTALION ASSEMBLY AREA.

b. If the target is rectangular, the length and width are given in meters; e.g., 200 BY 100. When the target is circular, the radius is given.

c. The long axis of a rectangular target is given to DS units to the nearest 50 mils; e.g., ATTITUDE 2500.

d. The description of the target includes the degree of protection of the target; e.g., TROOPS IN TRENCHES.

5. METHOD OF ENGAGEMENT

a. The method of engagement is based on the location and nature of the target, the type and quantity of ammunition available, the desired effects on the target, and the weapon system available. The method of engagement will include the following:

- (1) Type of adjustment.
- (2) Type of trajectory.
- (3) Type of ammunition.
- (4) Distribution of fire.

b. The type of adjustment indicates any special procedures to be used in the attack of the target. If the type of adjustment is not specified, area fire will be used. Special procedures include:

(1) MARK—Indicates rounds fired to:

(a) Orient the observer in his zone of observation.

(b) Indicate targets to ground troops, aircraft, or fire support ships.

(2) DESTRUCTION—The engagement of a target with the purpose of destroying it.

(3) DANGER CLOSE—When the target is close to friendly troops, the limits and special procedures are designed to insure the safety of the troops.

c. The type of trajectory indicates the use of high- or low-angle fire. Low-angle fire is used unless high-angle fire is specified.

d. The type of ammunition to be used in the engagement is indicated. The volume required may be included.

(1) The type of shell/fuze is indicated if shell HE, fuze quick, which is standard, is not to be used. If the type of ammunition required in adjustment and in fire for effect is different, the

words "in adjustment" and "in effect" are included.

(2) The volume of fire deemed necessary in fire for effect may be specified. The volume of fire serves as a warning for the preparation of a specified quantity or special type of ammunition.

e. Distribution of fire insures that fire is distributed adequately to cover the target. If distribution of fire is not specified, batteries fire with planes of fire parallel. Orders which may be used include:

(1) CONVERGE—Line of fire and range are concentrated on a point.

(2) CANCEL CONVERGE—Used to cancel CONVERGE.

6. METHOD OF FIRE AND CONTROL

Method of control is announced by use of the following terms:

a. FIRE FOR EFFECT.

b. TIME ON TARGET. Expressed in local time as a seven-digit date-time group or as on call; e.g., 091415S.

c. ADJUST FIRE.

d. AT MY COMMAND.

Note. When an element of the call for fire is standard, is not known, or is not required, it may be omitted. Designating each element by a number and the supplementary elements by letters facilitates transmission. For example, instead of transmitting the words "degree of protection," only the number/letter combination need be transmitted followed by the appropriate information; for example: 4*d*, TROOPS IN TRENCHES.

Form N-4. Call for Fire from Higher Headquarters (Special Ammunition)

The following is a list of the elements in a call for special ammunition fire from higher headquarters in the sequence in which they are transmitted.

1. Identification: _____, THIS IS _____.
2. Warning order/firing unit(s) : FIRE MISSION _____.
 - a. Size of unit to fire _____.
 - b. Firing point(s) _____.
3. Target location :
 - a. Target number _____.
 - b. Grid _____; altitude _____ meters.
 - c. Other _____.
4. Description of target:
 - a. Type _____.
 - b. Size _____.
 - c. Attitude (state unit of measure) _____.
 - d. Degree of protection _____.
5. Method of engagement :
 - a. Delivery system _____.
 - b. Type of ammunition/warhead _____.
 - c. Fuze/HOB option _____.
 - d. Number of rounds _____.
6. Control:
 - a. TOT _____.
 - b. Latest TOT _____.
 - c. Other _____.
7. Remarks:
 Special instructions _____.

Fire Support Coordination Agency Action
(Reverse side of Form N-4)

Appr/disap _____ by _____ Requested unit notified at _____	
Concurrences: G2(S2) _____ G3(S3) _____ NGF rep _____ ALO _____ Chem _____ Engr _____ Aja HQ _____	Firing unit notified at _____ Fired at _____ Warning: Army avn _____ TAF _____ Troop units _____ Notification higher HQ _____ Request fwd to _____ for action (Higher HQ)
Tactical damage assessment GZ _____ Yield _____ HOB _____ Remarks _____ _____ _____	Higher HQ Action taken: Appr _____ Disap _____ Firing unit _____ Fired at _____

Implementing Instructions for Calls for Special Ammunition Fire from Higher Headquarters

A format is required to enable divisional and higher artillery headquarters to forward calls for special ammunition fire to delivery units or to an intermediate artillery headquarters. The format is applicable to cannon, rocket, and missile units having the capability to deliver special ammunition fire. The format is outlined below. The reverse side of form N-4 (fire support coordination agency action) is designed to facilitate internal coordination. It is based on the special weapons standing operating procedures and the internal fire support coordination procedures. Some elements are the same in both the call for special ammunition fire and the call for conventional fire. Implementing instructions for these elements can be found by referring to the applicable elements in the implementing instructions of the conventional call for fire. This format may be used to request additional fires.

1. IDENTIFICATION

Same as in call for conventional fire.

2. WARNING ORDER/FIRING UNIT(S)

a. The basic warning order is **FIRE MISSION**. This element also specifies whether the target is a target of opportunity or a planned target. A code word prescribed at field army or corps level can be used. For example, **RED** can be used to indicate a call for fire on a target of opportunity and **BLUE** can be used to indicate a call for fire on a planned target.

b. This element may designate the firing unit(s) to engage the target; e.g., **1ST BATTALION, 20TH ARTILLERY**. A prearranged code word or the unit's call sign may be used in transmitting this element.

c. Item 2a, Size of unit to fire, indicates the number of gun(s)/launcher(s) or the specific gun/launcher to be used.

d. Item 2b, Firing point(s), indicates the specific firing point(s) to be occupied by the firing unit(s). Designation of the firing point can be by prearranged code, e.g., **FOXTROT BRAVO 14**, or by coded grid coordinates.

3. TARGET LOCATION

Same as in call for conventional fire.

4. DESCRIPTION OF TARGET

Same as in call for conventional fire.

5. METHOD OF ENGAGEMENT

a. The method of engagement is based on the location and nature of the target, the type and quantity of ammunition available, the desired effects on the target, and the weapon system available. The method of engagement will include the following:

- (1) Delivery system.
- (2) Type of ammunition/warhead.
- (3) Fuze/HOB option.
- (4) Number of rounds.

b. Item 5a, Delivery system, specifies the weapon system to be used in the engagement; e.g., **HONEST JOHN**.

c. Item 5b, Type of ammunition/warhead, specifies the ammunition and/or warhead to be used in the engagement. Certain delivery systems require both elements; other systems require only one element. Examples:

(1) Item 5b, **MGR-1B/M-57-X**. This example is for the Honest John system, and it specifies one of the two rocket motors available and the warhead to be used. Further warhead designation may be required.

(2) Item 5b, **M-426-X**. This example is for an 8-inch howitzer delivering a chemical projectile. By extending the **M-426** nomenclature, adding the suffix **X**, the agent to be delivered is specified by a prearranged code.

d. Item 5c, Fuze/HOB option, specifies the fuze option and/or HOB option. Nuclear weapons options are contained in appropriate weapon system publications. Fuze/HOB option elements will include the following:

- (1) HOB in meters (burst in meters above the target).
- (2) HIAR.
- (3) LOAR.
- (4) GND/IMPT.

e. Item 5d, Number of rounds, specifies the total number of rounds to be delivered.

6. CONTROL

a. Control measure to be implemented are based on the nature of the target and the scheme of maneuver.

b. Control measures include the following:

(1) Item 6a, TOT, is expressed in ZULU time as a date-time group.

(2) Item 6b, latest TOT, is expressed in ZULU time as a date-time group.

(3) Item 6c, Other, provides flexibility in exercising other control measures which may be necessary.

7. REMARKS

This element provides for special instructions or additional information that is required to supplement the normal information forwarded; e.g., report time of flight, report change of status, etc.

Form N-5. Fire Mission Record

Tgt no	Unit	Tim	Grid	Alt (meters)	Target description	Method of attack	Volleys	Observed by	Rounds fired by type	Observer's report and/or remarks

Form N-6 Nuclear Target Analysis Form

Target No. _____ DTG of selection _____ Method of weapon selection _____ Analyst _____ Target No. _____

WEAPON SYSTEM						TARGET INFORMATION					
Firing position						Description					
Yield						Category					
Range						Radius					
RD min						Location					
CD 90						Coverage desired prompt delayed					
HOB (option/meters)											
Initial coverage											
TROOP SAFETY											
Rod govn effect						(yes) (no)		(yes) (no)		(yes) (no)	
M S D											
Troop distance to DGZ											
Displacement											
PRECLUSION OF											
Obstacle		Damage									
LSD		Min dist									
Distance to DGZ											
Displacement											
RD/RT		RD/CD 90									
CD 90/RT		d/CD 90									
d/CD 90		d/RD									
d max											
FINAL DISPLACEMENT											
RD/RT		RD/CD 90									
CD 90/RT		d/CD 90									
d/CD 90		d/RD									
FINAL COVERAGE											
POSTRIKE DATA						SUPPLEMENTAL DATA					
Actual TOT				RD		Dazzle dist at TOT				REMARKS	
Actual GZ coord				RT		LSD: Army acft in flt					
Dist GZ tgt cen				d		LSD: tree blowdown					
Actual yield				RT		LSD: fire					
Actual HOB						Crater		Radius			
RD 50 or RD min								Depth			
Coverage				RD		Fallout prediction required		(yes) (no)			
PRECLUSION REQUIREMENT											
Obstacles											
Damage											
Fallout						(auth) (not auth)					
Other											
RECOMMENDATION / FIRE ORDER											
Unit						Firing Point					
Tgt No.		DGZ Grid		Tgt Alt							
Delivery system		Warhead		Yield							
HOB option		HOB		Backup fuze							
Desired TOT		Latest TOT									
Predicted coverage											
Best troop safety											
unwind ex		wrnd ex		wrnd prot							
MSD 3		MSD 2		MSD 1							
NEG											
EMERG											

Period

[illegible]

Form N-9. NBC Report Form

NATO UnclassifiedNBC 1

Purpose: Observer's initial report, giving basic data.

Letter	Meaning	Example (Nuclear)	Example (Chemical)	Example (Biological)
	Precedence (See note (1)) : Date-time : Security classification : From : To : Type of report :	NBC 1 (Nuclear)	NBC 1 (Chemical)	NBC 1 (Biological)
A.	Strike serial number (if known).			
B.	Position of observer (UTM or place).	B.LB 196400	MARVILLE	
C.	Direction measured clockwise from grid or magnetic north (state which) of the attack from observer (in degrees or mils) (state which).	C.Grid 060 (degrees)	C. Magnetic 060 (degrees)	
D.	Date-time attack started.	D.201405 Z	D.201405 Z	D.201405 Z
E.	Illumination time (sec) or time attack ended.	E. 4	E.201405 Z	
F.	Location of attack (UTM or place) (actual or estimated) (state which).			F.LB 2030, actual
G.	Means of delivery, if known.		G.Aerial spray	
H.	Type of burst (air, surface, or unknown) ; or type of toxic agent, if known; or type of attack (BW, CW, registration, harassing, etc.).	H.Surface	H.Nerve	H.Biological
I.	Number of shells, etc.			
J.	Flash-to-bang time (sec).			
K.	Crater present or absent and diameter, if known (in meters).			
L.	Nuclear burst cloud width immediately after passage of shock wave and/or sound of detonation (in degrees or mils) (state which).			
M.	Cloud height (top or bottom) or cloud width (state which) 10 min after burst (in degrees, mils, meters, or feet) (state which).	M.40,000 feet, top		
S.			S.201500 Z	S.201500 Z

- Note 1. As appropriate or as per unit SOP.
 2. NBC 1 follows the same format as the SHELLREP, MORTREP, and BOMREP included in STANAG 2008 dealing with conventional enemy attacks.
 3. The type of report and items D and H and either items B and C or item F must always be reported; other items are optional.
 4. Users of NBC 1 are not confined solely to the use of the letter items shown in the example; other letter items may be added at the user's discretion.

NATO Unclassified

NATO UnclassifiedNBC 2

Purpose: Used for passing evaluation data.

Letter	Meaning	Example (Nuclear)	Example (Chemical and biological)
	Precedence: Date-time: Security classification: From: To: Type of Report:	NBC 2 (Nuclear)	NBC 2 (Chemical/Biological)
A.	Strike serial number.	A.24	A.1
D.	Date-time attack started.	D.201405 Z	D.200945 Z
F.	Location of attack (UTM or place) (actual or estimated) (state which).	F.LB 187486 actual	F.LB 126456, actual
G.	Means of deliver, if known.		
H.	Type of burst (air, surface, or unknown) (state which) or type of toxic agent.	H.Surface	H.Nerve
N.	Estimated yield (ET).	N.50	

- Note 1. This report is normally based on two or more NBC 1 reports. It includes an estimated GZ and, in the case of nuclear detonations, an evaluated yield.
2. When adjacent agencies (e.g., Navy and National NBC Defense) use a different fallout prediction system, this form may be sent to the agencies to provide basic data for their fallout computations.
3. Items A, D, F, H, and N may be repeated as often as necessary to produce a summary report.
4. Users of NBC 2 are not confined solely to the use of the letter items shown in the example; other letter items may be added at the user's discretion.

NATO Unclassified

Form N-10. Tactical Damage Assessment Report

Date-time group: _____

From: _____

To: _____

1. This form is unclassified and remains unclassified unless it contains information of casualties or damage to friendly forces. Information of casualties or damage to friendly forces will be classified SECRET.

2. This report will be completed to the maximum extent possible and transmitted without delay. Additional information will be reported as it becomes available. Classified information will be transmitted separately by secure means.

a. Target number: _____.

b. Target data:

(1) Ground zero _____.

(2) Height of burst (underground, surface, or low or high air)____

(3) Weather conditions (at time of strike) _____.

(4) Time of detonation _____.

c. Results (by count or estimation) :

(1) Casualties: Enemy Civilian Friendly

Killed

Wounded

(2) Damage effect (radius in meters) :

Severe

Moderate

Buildings

Tree blowdown

Tanks

Wheeled vehicles

d. Contamination: Reports as indicated in Annex G (Chemical and Radiological Warfare) to III Corps Field SOP.

e. Obstacles created :

f. General discussion: Include any additional pertinent information.

(Name and rank)

(Unit)

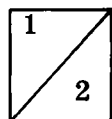
Form N-11. Allocation Summary (Special Ammunition)

HQ

Allocation period

Posted

Ln no	Column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	System															
B	Weapon	Total														
C																
D																
E																
F																
G																
H																
I																
J																
K																
L																
M																
N	Total allocation															
O	Total unexpended															
P																

Note

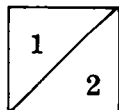
1. Weapons allocated for period.
2. Weapons remaining in allocation (unexpended).

Form N-12. Distribution Summary (Special Ammunition)

HQ _____ Posted _____

Ln no	Column number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	System															
B	Weapon		Total													
C																
D																
E																
F																
G																
H																
I																
J																
K																
L																
M																
N																
O																
P																
Q																
R																
S																
T																
U																

Notes:



As applicable

1. Weapons allocated to subordinate commands by corps and carried in the SAL of subordinate command units.
2. Weapons retained by corps and carried in the SAL of subordinate command units.

Form N-13. Daily Air Reconnaissance Plan Worksheet

Maps:

AF msn no call sign (1)	TOT (2)	Army requests no (3)	Target description (4)	Target grid (5)	Info desired (6)	Remarks (7)

Form N-14. Transport Helicopter Request Form

Helicopter mission request

Number ()

*A. _____, this is _____. I have a helicopter mission involving (C) troop lift, (D) cargo lift, (E) evacuation, (F) administrative transport, (G) utility, (H) search/rescue.

*B. (1) Date _____ (2) Time _____ (3) Time on station _____ (4) Charts _____ (5) Grid _____

C. TROOP LIFT: (1) Number of troops _____ (2) Pickup grid _____ (3) Landing zone coordinates _____ (4) Serials _____ (5) Remarks _____

D. CARGO LIFT: Internal, external, pallet, weapon, net. (1) Total weight _____ (2) Number of serials _____ (3) Remarks _____

E. EVACUATION: (1) Number of casualties _____ (2) Number of serials _____ (3) Remarks _____

F. ADMINISTRATIVE TRANSPORT: Courier, VIP. (1) Number of persons _____ (2) Baggage weight _____ (3) Pickup grid _____ (4) Landing zone grid _____ (5) Number of serials _____ (6) Highest rank _____ (7) Return time _____ (8) Remarks _____

G. UTILITY: Wire laying, spraying, liaison, UDT, photo, reconnaissance. (1) Other mission _____ (2) Remarks, time, location _____

H. SEARCH/RESCUE: Downed aircraft, other mission _____ (1) Number of personnel _____ (2) Description _____ (3) Grid to be searched _____ (4) Remarks _____

*I. LANDING ZONE DESCRIPTION: Prepared, unprepared, zone, site, clearing, field, ship (site no) _____ (1) Number of sites _____ (2) Alternate _____ (3) Remarks _____

*J. LANDING ZONE MARKINGS: Colored panels, smoke, lights, flare, flags (1) Color _____ (2) Remarks _____

*K. COMMUNICATIONS: UHF, HJ, LF, VHF (1) Primary _____ (2) Alternate _____ (3) Reporting point _____ (4) Report to _____ (5) Remarks _____

MISSION APPROVAL AND BRIEFING MESSAGE

*L. _____, this is _____. Mission no _____ approved, canceled with no _____ type aircraft Restrictive fire plan (SOP code) _____ in effect from _____ until _____

- (1) Routes to be flown
 - (2) Escort and support aircraft assigned: VH _____ VA _____
 - (3) Call sign of escort and support aircraft. Frequencies.
Time on station.
 - (4) Remarks _____
-

All items marked with an asterisk (*) *must* be filled out on every mission.
THIS FORM CONSTITUTES WRITTEN ORDERS TO THE PILOT. NO
DEVIATION WILL BE MADE EXCEPT TO MEET EMERGENCY
SITUATIONS. ANY DEVIATION WILL BE REPORTED.

Form N-15. Airlift Request Form

- Date _____
- A. Unit requesting airlift: _____
- B. Pickup point: _____
- C. Delivery point: _____ Airland _____ Airdrop _____
- D. Date and time first available for pickup: _____
- E. Latest acceptable in-place date at destination: _____
- F. Number of personnel: _____
- Weight of baggage (fld gear, etc.): _____
- G. Additional equipment less vehicles (weight and cube): _____
- _____
- _____
- H. Number of vehicles by type (dimensions/weight and cube): _____
- _____
- I. Largest single item (dimensions and weight): _____
- J. Any restrictive cargo: _____
- K. Contact and alternate at pickup point: _____
- L. Contact and alternate at delivery point: _____
- M. Total weight and cube (do not include passenger's weight): _____
- N. Remarks, special instructions, justification (Special equipment required, litters, number of airdrop items with weight and cube of each, etc.): _____
- _____
- _____



APPENDIX O **TARGET CLASSIFICATION AND METHODS OF ENGAGEMENT**

Target	*Ammunition	Designation		Method
		Location	Size	
Pinpoint	HE quick HE delay HE VT HE time Smoke BE (HC or colored) Smoke, WP Special	Grid to nearest 10 meters	Not given	(1) Planes of fire parallel (2) Converged
Registration	HE quick HE time	Grid to nearest 10 meters	Not given	Registration procedures
Destruction	HE quick HE delay HE concrete-piercing	Grid to nearest 10 meters	Not given	Destruction procedures
Mark	HE quick Smoke	Grid to nearest 10 meters	Not given	Round(s) fired for identification
Area	HE quick HE delay HE VT HE time Smoke BE (HC or colored) Smoke, WP Special	Grid to nearest 10 meters	1. Radius of target 2. Length, width, and attitude	(1) Planes of fire parallel (2) Converged (3) Open (4) Range/lateral spread (5) Fire units directed at different parts of target
Area	Illuminating	Grid to nearest 10 meters	1. Radius of target 2. Length, width, and attitude	Illumination procedures
Linear	HE quick HE delay HE VT HE time Smoke HC Smoke WP Special	Grid to nearest 10 meters	Length and attitude	Individual guns directed at specified points along the length.

Target	*Ammunition	Designation		Method
		Location	Size	
Moving barrage (CDA/AUST) Searching and/or zone fire (US)	HE quick HE VT HE delay HE time	ABCA format Grid to nearest 10 meters	Length, width, and attitude	Individual guns directed at specified points along the width; fire moves forward as directed.
Radar adjustment	Pinpoints or area targets	Grid to nearest 10 meters	Pinpoint or area targets	Radar adjustment procedures.
Sound adjustment	Pinpoints or area targets	Grid to nearest 10 meters	Pinpoint or area targets	Sound adjustment procedures.

*The detail stated in this column does not preclude the use of other types of ammunition.

APPENDIX P

ILLUSTRATIVE FIRE SUPPORT ANNEX

(Numbers in parentheses refer to explanatory notes.)

Explanatory notes

(1) The *security classification* assigned to the fire support annex. The classification appears at the top and bottom of each page of the annex, overlays, appendixes, tabs, and inclosures.

(2) Since this annex is normally classified, each copy must be numbered for accounting purposes.

(3) The *force headquarters* responsible for the conduct of the operation.

(4) The *place of issue*. Usually expressed as a general geographic location, amplified by coordinates.

(5) *Date and time of signature*. Designated by a six-digit date-time group. Unless otherwise indicated in the annex, this is the date and time at which this annex becomes effective. Normally coincides with the date and time contained in the basic operation order.

(6) *Message reference number*. Usually expressed as a coded symbol. Used by recipients when indicating receipt of the annex in accordance with instructions contained in the ending of the plan.

(7) *Designation of the fire support annex*. Consists of the appropriate letter designation followed by reference to the basic document (operation order).

(8) *References*. Maps or publications necessary to the understanding of the annex by all recipients are listed. Maps should be identified as accurately as possible. The map series number, edition, country, scale, and sheet number(s) should be shown.

(9) *Time zone*. If recipients are located in two or more time zones, the time zone of the issuing headquarters (for basic reference) is entered here. When all recipients are in the same time zone, the time zone is omitted. If the time zone is different for any elements of the command in the area of execution, the entry must state when the indicated time zone becomes effective.

(Classification) (1)

Copy No 14 (2)

1st Inf Div (3)

PACIFIC CITY (1935), BAHA (4)

131800 Sep 19__ (5)

GT 36 (6)

Annex C (Fire Support) to OPORD 18 (7)

Reference: Map, BAHA, 1:50,000, CAPE

FORTH-ATHENAL, Sheet 4224 IV. (8)

Time zone: Quebec (9)

(Classification)

(10) *Situation*. State in subparagraphs a, b, and c, respectively, as much of the general situation as is deemed necessary for commanders and staffs of the fire support agencies to know concerning enemy capabilities which can affect fire support agencies. Show the fire support units which will support the force or reinforce fires of organic or attached units, and the units which are attached to, or detached from, the force.

(11) *Enemy forces*. Refer to the current intelligence annex or publication which contains information concerning the enemy situation. If pertinent, refer to any particular enemy capability (such as air) which may have a definite impact on fire support agencies.

(12) *Friendly forces*. State as much of the mission of the next higher and adjacent headquarters as is required for coordinated action by recipients of the fire support annex. List the units furnishing air support to the army or corps. Follow with the fire support units, *not organic or attached*, on which the force may call directly for fire support (e.g., corps arty battalions or groups with GSR or reinf missions or naval units in GS or DS). Organization for combat of reinforcing units *may* be shown. Long range missile units that may possibly fire in general support of the force operation may be included.

(13) *Attachments and detachments*. List fire support units now attached, or which are attached or detached by the operation order, together with the effective date and time.

(14) *Mission*. State the mission of the fire support agencies. Essential elements of the force mission may be included when it is necessary to clarify fire support requirements.

(15) *Execution*. In separation lettered subparagraphs, give a brief concept of the operation and indicate fire support to be rendered by available fire support agencies, such as air, artillery, and naval gunfire. When available, nuclear, and chemical support, although not rendered by separate fire support agencies, are also listed separately to indicate their importance. List fire support agencies in alphabetical order.

(16) *Concept of operation*. In paragraph 3a, state the force commander's concept of operation. The commander's concept may be quoted verbatim from the operation order. This paragraph may

(Classification)

1. SITUATION (10)

a. Enemy Forces. (11)

(1) Annex A (Intel) to OPORD 18.

(2) Enemy air capable of 40 bomber and 150 fighter-bomber sorties per day in zone of 1st Corps.

b. Friendly Forces. (12)

(1) 1st Corps attacks 140430 Sep with 1st Inf Div on the east, 2d Inf Div on the west; seizes the north bank of the IDAWANA River; and destroys enemy in zone.

(2) 9th TAF supports 1st Army with minimum allocation of 300 CAS sorties daily for period 140400 to 152000 Sep. Priority to 1st Corps until seizure of north bank of IDAWANA.

(3) Artillery support.

(a) 1st Bn (Pershing), 96th FA: GS 1st Army; priority of fires to 1st Corps.

(b) 4th Armd Div Arty: 1st Bn (155-mm, SP), 32d FA; 1st Bn (155-mm, SP), 34th FA; 1st Bn (155-mm, SP), 36th FA; 1st Bn (155-mm/8-in, SP), 38th FA; 1st Bn (HJ), 30th FA; GSR 1st Inf Div Arty; on order revert to 4th Armd Div control.

(c) 101st FA Gp: Reinf 1st Inf Div Arty.

(4) Naval support. Fire Support Group (TG 38.1) supports 1st Corps; Fire Support Unit Two (TU 38.12) provides support to 1st Inf Div.

c. Attachments and Detachments. (Attached effective 131900 Sep). (13)

(1) 1st Bn (105-mm, SP), 40th FA

(2) 6th Bn (155-mm, SP), 50th FA

(3) 1st Bn (C/V) (SP), 48th ADA

2. MISSION (14)

Artillery with the division and supporting fire elements support 1st Inf Div operations with nuclear and conventional artillery, air, naval gunfire, and air defense support.

3. EXECUTION (15)

a. Concept of Operation. (16)

(1) General. The attack will be a rapid exploitation of nuclear fires. Surprise is vital. Maximum dispersion consistent with accomplishment of the mission will be maintained throughout the operation.

(2) Maneuver. Division will penetrate aggressor positions with two brigades abreast. 1st Bn on the west makes attack and seizes Objective.

1. 2d Bde on the east seizes Objective

2. 3d Bde in reserve.

(Classification)

be divided into subparagraphs, as shown in this example. Normally, the portion relative to maneuver (if extensive) is condensed and the portion relative to fire support is given in detail.

(17) *Air support.* Paragraph 3b is divided into three subparagraphs. In the first subparagraph, give general information concerning air support available to higher headquarters and the commander's desires regarding use of this support. In the second subparagraph, give allocations of air support by higher headquarters that are not further allocated to subordinate units. (If necessary, used an additional subparagraph to give allocations to subordinate units. Allocations normally are not suballocated below corps level except for planning purposes.) In the third subparagraph, give miscellaneous coordinating instructions and information concerning air support or the method and time of requesting preplanned airstrikes when such airstrikes are not covered by SOP or constitute a change to SOP. As a minimum, this subparagraph must make reference to the air fire support appendix.

(18) *Artillery support.* When ADA is organic or attached to the force, paragraph 3c is divided into two subparagraphs, FA and ADA, which are divided into three subparagraphs, General, Organization for combat, and miscellaneous. *FA General.* Give information of the echelons of artillery, such as corps or division artillery, which will support the operation; information concerning preparation fire, if any, and its duration; and any restrictions placed on the use of higher echelon artillery with a primary mission of reinforcing division artillery. *FA Organization for combat.* 1. Division Artillery. Give organization for combat of artillery units organic or attached to the command. A mission must be assigned to each. List FA groups attached to the division and show elements thereof. List division artillery units, organic or attached, in numerical sequence by regimental number. Batteries assigned a separate tactical mission under direct division artillery control are listed separately in alphabetical sequence immediately following the parent battalion. 2. *Reinforcing artillery.* Give instructions to any artillery units, not organic or attached, which have a mission of reinforcing division artillery. Organization for combat of re-

(Classification)

(3) Fire support. At H-30, division will employ one CHARLIE weapon on enemy forces on Hill 374 (1939) and one ALFA weapon on Hill 412 (2241). A 35-minute nonnuclear preparation will be fired beginning at H-25. Initial division reserve consists of two 31-KT CHARLIE weapons.

b. Air Support. (17)

(1) General. Sixteen fighter-bombers on air alert from H-hour to H+1 hour over corps zone to be assigned missions as approved by corps tactical operations center. Armament—mixed load.

(2) Allocations. Priority of air support to 1st Inf Div for period 140400 to 140900 Sep.

(3) Miscellaneous. Appendix 1, Air Fire Support.

c. Artillery Support. (18)

(1) FA.

(a) General. Artillery will support the attack with a nuclear preparation commencing at H-30. H-hour is 140430. A nonnuclear preparation will be fired from H-25 to H+10.

(b) Organization for combat.

1. Div Arty.

1st Bn, 3d FA: DS 1st Bde.

1st Bn, 5th FA: DS 2d Bde.

1st Bn, 7th FA: GSR 1st Bn, 3d FA;
on order DS 3d Bde.

1st Bn, 9th FA: GSR 1st Bn, 5th FA.

1st Bn (HJ), 10th FA: GS.

1st Bn, 40th FA: Reinf 1st Bn, 3d FA;
on order reinf 1st Bn, 7th FA.

6th Bn, 50th FA: GS.

2. Reinf arty.

101st FA Gp: 1st Bn (155-mm, SP),
50th FA;

1st Bn (155-mm, Towed), 51st FA;

1st Bn (8-in, SP), 70th FA;

2d Bn (8-in, SP), 70th FA.

(c) Miscellaneous.

1. 1st Bn, 3d FA, plans the fires of 1st

(Classification)

inforcing units will be shown here if not shown in paragraph 1b. *FA Miscellaneous*. Give miscellaneous instructions and information that affect more than one unit, such as instructions on planning of fires, position areas, and zones of fire (usually a reference to an appendix or tab); these instructions may also include allocation of authority to expend non-nuclear special ammunition. As a minimum, this subparagraph, will make a reference to the artillery fire support appendix. The ADA subparagraph, when used, has the same subdivisions as the FA subparagraph.

(19) *Naval support (when applicable)*. This paragraph is similar to the air support paragraph. In the first subparagraph, give general information. In second subparagraph, give allocations of fire support from higher headquarters, plus suballocations of fire support and of control personnel to lower echelons. In the third subparagraph, give miscellaneous instructions. As a minimum, this subparagraph must make reference to the naval gunfire support appendix.

(20) *Nuclear support (when applicable)*. As a minimum, this paragraph will make reference to the nuclear fire support appendix. It may be similar to the air support paragraph and give the general plan of employment and, if appropriate, allocations of authority to expend nuclear weapons.

Note. When a small number of nuclear fires are planned, they may be included as part of other fire support appendices. Normally, all fires will be included in a single nuclear fire support appendix when many targets are to be attacked with nuclear fires.

(21) *Coordinating instructions*. This is the last subparagraph of paragraph 3. This subparagraph contains instructions applicable to two or more fire support agencies, such as procedures for the marking of airstrikes by ground fires, restrictions on firing by ground and naval weapons while friendly aircraft are conducting airstrikes, procedures for coordinating counterflak fires, and the time that fire support annexes and appendices must be submitted to the agency responsible for fire support coordination. Miscellaneous troop safety instructions, such as permissible exposure to radiation, protection during nuclear blasts, and notification to subordinate units of impending use of nuclear weapons by friendly forces, are also included when applicable. Fur-

(Classification)

Bn, 7th FA for the preparation only.

2. 1st Bn, 5th FA, will plan the fires of 1st Bn, 9th FA, from H-10 to +10.

3. Appendix 2, Artillery Fire Support.

(2) ADA.

(a) General. Air defense artillery will provide air defense for forward combat elements and key installations in the division sector.

(b) Organization for combat. (All attachments eff 131900 Sep). Btry A, 1st Bn (C/V) (SP), 48th ADA: Atch 1st Bde. Btry B, 1st Bn (C/V) (SP), 48th ADA: Atch 2d Bde. Btry C, 1st Bn (C/V) (SP), 48th ADA: Atch 3d Bde. 1st Bn (C/V) (SP), 48th ADA(-): Protect in priority div CP and div airstrips.

(c) Miscellaneous. Appendix 3, Air Defense Artillery Fire Support.

d. Naval Support. (19)

(1) General. Fire Support Unit Two (TU 38.12) support the attack beginning H-1 hour; support the attack with preparation from H-25 to H+10.

(2) Authority to expend.

(a) ICA: GS div until rel on corps order.

(b) 1DD: DS 1st Bde.

(3) Miscellaneous. Appendix 4, Naval Gunfire Support.

e. Nuclear Support. Appendix 5, Nuclear Fire Support. (20)

f. Coordinating Instructions. (21)

(1) Subordinate units will be notified of nuclear fires through command fire direction channels.

(2) Tactical damage assessment reports to div FSE.

(3) Fire spt app to div FSE prior to 132200 Sep.

(4) The counterbattery status is active; criteria to be announced.

4. SERVICE SUPPORT (22)

a. Div ADMINO 14.

b. ASR (122400-172400 Sep).

105-mm	150
155-mm	120
8-inch	60
40-mm	To be announced

(Classification)

(Classification)

ther items of interest to units, such as the location of the fire support coordination line and counterbattery tactics, should also be indicated.

(22) *Service support.* Refer to the current administrative order. List any special administrative instructions applicable to this operation and of concern to the fire support agencies, such as a directive to store ammunition in excess of basic load on position. State only items which are of interest to fire support agencies, which require special emphasis, or which have changed since the administrative order was published. These may include the location of the division ammunition office (DAO), appropriate available supply rates, and the special ammunition loads.

(23) *Command and signal.* In the signal subparagraph, refer to the current signal annex and the index to the signal operation instructions (SOI), if appropriate. In the command subparagraph, state locations of the agencies responsible for fire support coordination.

(24) *Acknowledgement instructions.* If the issuing headquarters wishes acknowledgment of receipt of the annex by addressees, the word "acknowledge" must appear after paragraph 5. Acknowledgment connotes receipt, understanding, and intent to comply. The message reference number is used when recipients acknowledge receipt either by electronic or written communication.

(25) *Signature.* The original of the fire support annex, like the original of the operation order, is signed by the *force commander* or his authorized representative. The annex is *authenticated* by the force G3 (S3), who has the staff responsibility for the integration of fire support with the plan of maneuver.

(26) *Appendixes.* Additions that are necessary to amplify the fire support annex are contained in appendixes numbered serially with Arabic numerals. Appendixes preserve brevity, clarity, and simplicity in the body of the annex and aid recipients in locating and understanding instructions pertaining to them. Appendixes are referred to in the appropriate portion of the annex.

(27) *Distribution.* If distribution is to be made according to a standard distribution list, it may be indicated as A, C, etc. Recipients are included in the standard list must be shown separately. The standard distribution list may not be appropriate for the annex being issued, and a separate appendix, showing recipients, number of copies, and copy numbers, may have to be prepared.

5. COMMAND AND SIGNAL (23)

a. Signal.

- (1) SOI, Index 1-66, eff 140001 Sep.
- (2) Normal radio traffic prior to atk.
- (3) Annex S (Signal).

b. Command.

- (1) FSE located at div CP.
- (2) Div arty CP (initial).

LE 190360.

Acknowledge (24)

McDONALD (25)
MG

OFFICIAL:

/s/Chelberg
CHELBERG
G3

Appendixes:
(26)

- 1—Air Fire Support
- 2—Artillery fire Support
- 3—Air Defense Artillery Fire Support
- 4—Naval Gunfire Support
- 5—Nuclear Fire Support

Distribution:
(27)

- A
- 4th Armd Div Arty
- 101st FA Gp
- Naval Fire Support Unit Two (TU 38.12)
- 9th TAF

(Classification)



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